"branching above the middle"), from France, June, 1890, *S. E. Lassinome* (identification validated by *McVaugh*); FIG. 2, flowering summit, × 1, of same specimen. FIG. 3, SPECULARIA HYBRIDA (L.) A. DC.: portion of plant, × 1, to show characteristic basal branching (not merely "branching above the middle"), from Etruria, *Fiori* in Fiori & Béguinot, Fl. Ital. Exsicc., no. 1962bis (identification validated by *McVaugh*).

PLATE 1050. SPECULARIA COLORADOENSIS Buckl. = *Triodanis coloradoensis* (Buckl.) McVaugh, from specimens validated by McVaugh: FIG. 1, median third of plant, × 1, showing branching "above the middle" (not "branches, if any, from base or middle") and fruits "corymbiform aggregated" (not with "inflorescence spiciform") from New Mexico, *Chas. Wright*, no. 1432; FIG. 2, flowering inflorescence, × 1 (cf. PLATE 1049, FIG. 2) from plant raised by Asa Gray from Wright's seed.

THE GENUS LIATRIS

L. O. GAISER

(*Continued from page 183*)

Var. TYPICA, forma **montana** (Gray), comb. nov., spikes short, ca. 3 dm. long; basal leaves 2–4 dm. long, 1.5–2 cm. wide. Mostly from the mountains of North Carolina. *L. spicata* var. *montana* Gray, Synop. Fl. 1². 111 (1884), in part. VIRGINIA. BATH Co.: vicinity of Millboro (alt. 480 m.), Aug. 24, 1907, *E. S. Steele* (US); vicinity of Millboro (alt. 510 m.), Sept. 5, 1906, *E. S. Steele* (US). NORTH CAROLINA. MITCHELL CO.: Yellow Mt., *Curtis* (NY); Roan Mt., 1893, *H. A. Edson* (US); Little Roan Mt., (alt. 1800′), Sept. 9, 1892, *C. H. Merriam* (G, NY, US); Little Roan, July 19, 1880, *J. D. Smith* (US). BUNCOMBE Co.: Mt. Negro, July, 1841, *A. Gray & J. Carey* (G, type of *L. spicata* Willd. var. *montana* Gray); moist ground, slopes of Craggy Mt., July 13, 1897, Biltmore Herb., 579c (G, NY, US); wet hillside, vicinity of Montreat, Sept. 9, 1913, *P. C. Standley & H. C. Bollman* 10520 (US). HAYWOOD Co.: Frying Pan Gap & Big Baldy, Pisgah Forest (alt. 5000′–5300′), July 25, 1925, *P. A. Rydberg*, 9517 (NY). JACKSON Co.: damp rocks, summit of Devil's Court, House Peak (alt. 4800′), Sept. 1, 1882, *J. D. Smith*, 212 (US). SOUTH CAROLINA. PICKENS Co.: cliffs, Table Mt. (alt. 2600′), Aug. 1896, *J. K. Small* (NY). GEORGIA. DADE Co.: woods, Lookout Mt., July, 1893, *A. Ruth*, 658 (US).

Var. **resinosa** (Nutt.), comb. nov. A more slender, glabrous phase (hirsute only very exceptionally) from the drier barrens southward to the Gulf of Mexico: stems more slender than in var. *typica*, though frequently as tall, the upper two-thirds strict: leaves narrowly linear, the basal 2–4 dm. long and rarely exceeding 5 mm. in width, reduced upward quite abruptly: inflorescence spicate, 1.5–7 dm. long, when more elongated the heads sometimes scattered and the inflorescence loosely spicate: heads

cylindrical, usually of 4–7 flowers, sometimes up to 12, 8–12 mm. long and ca. 5 mm. thick at time of flowering; phyllaries usually correspondingly shorter than in var. *typica* but similarly appressed, sometimes glutinous and adherent, obtuse, with narrow scarious margin, frequently colored at time of flowering.—*Liatris resinosa* Nutt. Gen. ii. 131 (1818), not of DC.; Chapman, Fl. So. U. S. 192 (1860) and ed. 3, 211 (1897). *Liatris sessiliflora* Bertol. Misc. Bot. v. t. 2 (1846). *Laciniaria vittata* Greene, Pittonia, v. 57 (1902). *Liatris spicata* var. β Torr. & Gray, Fl. N. Am. ii. 73 (1841).

Pennsylvania to Tennessee, south to Florida and Mississippi.—PENNSYLVANIA. Bucks Co.: Without stated locality, 1882, *C. D. Fretz* (Q). Delaware Co.: Aston Mills, 1904, *F. W. Pennell* (US); serpentine, Williamson, Aug. 3, 1909, *F. W. Pennell*, 1413 (US). Lancaster Co.: vicinity of mouth of the Tucquan, Aug. 7, 1890, *J. K. Small* (US). MARYLAND. Baltimore Co.: near Baltimore, 1873, *Dr. E. Foreman* (US, NY); Catonsville, near Baltimore, Aug. 10, 1873, *Morong* (NY). DELAWARE. Newcastle Co.: gravelly roadside bank, w. of Chestnut Hill, 6 mis. s. of Newark, Elkton Rd., Sept. 9, 1937, *R. R. Tatnall*, 3532 (G). VIRGINIA. Sussex Co.: dry pinelands, about 4 mis. n. w. of Waverly, July 26, 1936, *M. L. Fernald & B. Long*, 6417 (G); damp woods, bordering Assamoosick swamp, about 2 mis. n. e. of Homeville, Aug. 24, 1938, *M. L. Fernald & B. Long*, 9171 (G). Dinwiddie Co.: open argillaceous low woods, just e. of McKenney, Oct. 13, 1941, *M. L. Fernald & B. Long*, 14035 (G). NORTH CAROLINA. Co. undetermined: eastern North Carolina, 1901, *F. M. Jones* (NY). Rowan Co.: Faith Post Office, Aug. 14, 1891, *J. K. Small & A. A. Heller*, 355 (G, NY, US, Q). Burke Co.: without stated locality, 1835, *Mr. Curtis* (NY). Buncombe Co.: rocky soil, on Cedar Cliff Mt., Aug. 17, 1904, *Biltmore Herb.*, 579k (US). Henderson Co.: swamps of Muddy Creek, Aug. 19, 1881, *J. D. Smith* (US); open woods, Aug. 21, 1881, *J. D. Smith*, 184 (US); summit, Devil's Peak, Apr. 1882, *J. D. Smith* (US). Haywood Co.: Looking Glass Rock, Pisgah Forest, Aug. 9, 1909, *H. D. House*, 4412 (US). Sampson Co.: pineland, near Roseboro, Aug. 5, 1938, *R. K. Godfrey*, 5716 (G). Onslow Co.: savannah, 12 mis. w. of Jacksonville, Aug. 6, 1938, *R. K. Godfrey*, 5739 (NY), savannah 8 mis. s. w. of Jacksonville, Sept. 1, 1938, *R. K. Godfrey*, 6465 (G). Pender Co.: Big Savannah, Sept. 4, 1924, *B. W. Wells* (NY). Bladen Co.: near Bladensboro, Sept. 3, 1908, *W. W. Eggleston*, 4028 (G, NY, US). New Hanover Co.: wet bog, near Wilmington, Sept. 8, 1927, *W. H. Munter* (G). Brunswick Co.: pineland, near Wilmington, Aug. 28, 1938, *R. K. Godfrey*, 6225 (G). Columbus Co.: pineland, near Hallsboro, Aug. 29, 1938, *R. K. Godfrey*, 6253 (G). SOUTH CARO-

LINA. GREENVILLE Co.: rocky hillside, Caesar's Head, *J. D. Smith*, Aug. 1881 (No. 185) (US), Aug. 5, 1881 (G); Caesar's Head, Aug. 10, 1881, *J. D. Smith* (US); Greenville, Aug. 2, 1881, *J. D. Smith* (US). CHESTERFIELD Co.: near MacBee, Aug. 1936, *W. Rhoades* (G). DARLINGTON Co.: sandhills, dry soil, Hartsville, July 27, 1920, *J. B. Norton* (US). FLORENCE Co.: in a dry sandy place, about 1 mi. w. of New Hope, Sept. 8, 1938, *R. Clausen & H. Trapido*, 3550 (NY). HORRY Co.: without stated locality, Oct. 8, 1934, *G. F. Tarbox* (NY); savannah, near Conway, Sept. 1, 1940, *P. O. Schallert* (G). GEORGETOWN Co.: grass-sedge upland bog or savannah, 5 mis. s. of Georgetown, Sept. 9, 1939, *R. K. Godfrey*, 8100 (G, NY). BERKELEY Co.: grass-sedge upland bog or savannah, 2 mis. w. of Jamestown, Sept. 11, 1939, *R. K. Godfrey*, 8182 (G, NY). GEORGIA. Without stated locality: *Dr. Boykin* (NY). HANCOCK Co.: Sparta, July 27, 1901, *Biltmore Herb.*, 579h (US). DODGE Co.: damp pine barrens, Eastman, Oct. 20, 1893, *C. Mohr* (US). SUMTER Co.: moist pine barrens, in s. e. part, Sept. 10, 1900, *R. M. Harper*, 620 (G, NY, US, B). WARE Co.: grassy pine barrens, Waycross, Aug. 23, 1900, *Biltmore Herb.*, 579e. (US). COLQUITT Co.: between Moultrie and Kingwood, Sept. 22, 1902, *R. M. Harper*, 1652 (G, US). THOMAS Co.: Thomasville, Oct. 16, 1903, *Mrs. Taylor* (G). FLORIDA. Without stated locality: *ex Herb. J. Torrey* (NY); *Leavenworth* (G); *Chapman* (G, NY). Co. UNDETERMINED: middle Fla., *Chapman*, 338 (NY). DUVAL Co.: swamp, pine barrens, Oct. 30, 1893, *A. Fredholm*, 394 (US); Jacksonville, Aug. 1896, *L. H. Lighthipe* (B); moist pine barrens, near Jacksonville, Oct. 15, 1894, *A. H. Curtiss*, 5311 (NY, US); Jacksonville, *A. H. Curtiss* (US). BAKER Co.: Glen Saint Mary, Oct. 1927, *H. H. Hume* (G). COLUMBIA Co.: flatwoods n. of Lake City, Oct. 15, 1893, *P. H. Rolfs* (F). LEON Co.: old field, Tallahassee, Oct. 20, 1942, *Henry & Beggs* (F). GADSDEN Co.: open pinelands, w. part of county, Aug. 30, 1931, *H. Foster* 114 (F). FRANKLIN Co.: swamps, near Apalachicola, Aug. 20, 1872, *Biltmore Herb.*, 579b (NY, US). BAY Co.: open moist ground, Lynn Haven, Oct. 12, 1921, *C. Billington* (US); Lynn Haven, Oct. 24, 1939, *R. A. Knight* (F). WASHINGTON Co.: Chipley, Aug. 31, 1942, *C. M. Senner* (F). WALTON Co.: boggy places, near Argyle, Oct. 2, 1901, *A. H. Curtiss*, 6923 (US, Q); moist soil, de Funiak Springs, Sept. 26, 1900, *Biltmore Herb.*, 579j (US). CLAY Co.: 5 mis. w. of Penney Farms, Sept. 22, 1939, *W. A. Murrill* (F). PUTNAM Co.: low pineland, along U. S. Hwy. 17, 10 mis. n. of Palatka, Sept. 24, 1940, *Ruth & West* (F). UNION Co.: wet shaded edge of flatwoods, 2 mis. n. e. of Lake Butler, Oct. 19, 1941, *W. A. Murrill* (F). ALACHUA Co.: flatwoods 3 mis. s. of La Crosse, Nov. 3, 1941, *W. A. Murrill* (F); low pineland, Fairbanks, Oct. 18, 1927, *G. F. Weber & E. West*

(F); along road to Fairbanks, Oct. 28, 1936, *H. K. Wallace & Miss L. Arnold* (F); swamp s. w. of Worthington Springs, Oct. 1945, *H. H. Hume* (F). Taylor Co.: open flatwoods, 14 mis. s. of Perry, Oct. 8, 1940, *W. A. Murrill* (F). Dixie Co.: flatwood, 3 mis. n. e. of Shamrock, Aug. 28, 1937, *Pasture Survey* (F); 5 mis. s. of Cross City, Oct. 8, 1940, *W. A. Murrill* (F). Flagler Co.: "Korona meadow", near route 1 n. of Ormond, Aug. 2, 1943, *Mrs. H. T. Butts* (G); low ground, US no. 1, Aug. 23, 1944, *Mrs. H. T. Butts* (OA); near Rwy., s. of Dupont, June 27, 1944, *Mrs. H. T. Butts* (OA); Rwy. ditch, s. of Bunnell, spring of 1944, *O. Ames* (OA); flatwoods, 10 mis. e. of co. line, Hwy. 28 near St. Johns Park, Oct. 10, 1940, *E. West* and *Miss L. Arnold* (F). Volusia Co.: flatwoods s. of Pierson, Sept. 17, 1943, *E. West & Miss L. Arnold* (F). Orange Co.: sand scrub, Windermere, Oct. 2, 1929, *F. Vasku* (F); flatwoods, Orlando, Oct. 9, 1929, *F. Vasku* (F); flatwoods, Vineland, Oct. 17, 1929, *F. Vasku* (F); low grassy pineland, Ft. Christmas, Sept. 24, 1927, *O. F. Burger & E. West* (F). Hernando Co.: near Bayport, July 15, 1919, *R. N. Jones* (US). Brevard Co.: in wet soil of prairie-like area in flatwoods, w. of Cocoa, Sept. 2, 1937, *A. S. Rhoads* (F). Manatee Co.: Bradentown, July 5, 1900, *S. M. Tracy*, 7078 (T); in moist ditch, Palma Sola along roadside, Aug. 19, 1945, *L. O. Gaiser, Mrs. H. T. Butts, Miss L. Arnold* (F). Osceola Co.: swamp, Oct. 12, 1903, *A. Fredholm*, 6086 (G). Okeechobee Co.: Okeechobee, Sept. 10, 1903, *A. Fredholm*, 5999 (G); in low pineland, 4 mis. e. of Okeechobee, Sept. 11, 1929, *H. O'Neill* (US). Collier Co.: prairie s. of Deep Lake, Dec. 7, 1925, *J. K. Small & W. M. Buswell* (NY). Dade Co.: in Everglades Key, Long Pine Key, Aug. 25, 1937, *Miss E. Scull* (F). TENNESSEE. Davidson Co.: Nashville, *Dr. Gattinger* (US). Coffee Co.: Tullahoma, *Biltmore Herb.*, Aug. 7, 1899 (No. 673), Aug. 20, 1897 (No. 579) (US); low woodland near Tullahoma, Oct. 2, 1902, *Biltmore Herb.*, 579n. (US). ALABAMA. Without stated locality: *Dr. Buckley* (G, NY), 1831, *Dr. Gates* (G, NY, B, isotypes of *L. sessiliflora* Bert.), 1878, *G. R. Vasey* (US). Co. undetermined: near the Wash, Retaei, common, low pine barrens, Oct. 1877, *C. Mohr* (NY). Marshall Co.: swamps near Albertville, July 10, 1899, *Biltmore Herb.*, 579m (NY). Cullman Co.: near Garden City, July 28, 1938, *H. K. Svenson*, 9418 (B). Lee Co.: Auburn, Aug. 11, 1897, *F. S. Earle & C. F. Baker*, 1160 (NY). Autauga Co.: wet pine barrens, w. of Autaugaville, Aug. 2, 1938, *H. K. Svenson & R. M. Harper*, 9505 (G); flat pine woods, 1 mi. n. e. of Autaugaville, Aug. 2, 1938, *R. M. Harper*, 3689 (G, NY, US). Bullock Co.: Culvers, Aug. 6, 1896, *C. Mohr* (US). Montgomery Co.: Pentulleh Creek, July 1884, *C. Mohr*, 16 (NY); dry open banks, Pentulleh, July 10, 1884, *C. Mohr* (US). Dallas Co.: open

swamp, along Mud Creek, w. of Selma, Aug. 1, 1938, *H. K. Svenson & R. M. Harper* 9790 (G). BALDWIN Co.: Gateswood, *S. M. Tracy*, Oct. 30, 1903 (No. 8567) (G, NY, US, T), Oct. 30, 1903 (No. 8568) (ND), Oct. 31, 1903 (No. 8571) (ND). MOBILE Co.: low flat pine barrens, Mobile, Oct. 10, 1871, *C. Mohr* (US); damp pine barrens, Aug. *Geol. Surv.*, *C. Mohr* (US); low pine barrens, Mobile, Sept., 1878, *C. Mohr* (US); damp pine barrens, Mobile, Oct. 1878, *C. Mohr* (US); pine woods, Mobile, Oct. *C. Mohr* (US); Mobile, *C. Mohr* (US); Chickahasa River, Mobile, Oct. 7, 1894, *C. S. Mohr & J. Sargent* (US); near swamp, w. of Spring Hill, Sept. 1918, *E. W. Graves*, 595 (US); pine barrens, Spring Hill, Aug. 1919, *E. W. Graves*, 731 (US). MISSISSIPPI. JACKSON Co.: Ocean Springs, Aug. 31, 1891, *A. B. Seymour & F. S. Earle*, 132 (G), Aug. 31, 1895, *J. Skehan*, 2795 (G), Sept. 6, 1889, *F. S. Earle* (ND); swampy open pine barrens, Moss Point, Aug. 8, 1933, *O. Degener*, 4973 (NY). HARRISON Co.: grassy pine barrens, near Mississippi City, Sept, 14, 1885, *J. D. Smith*, 426 (US); Biloxi, Sept. 3, 1900, *F. E. Lloyd & S. M. Tracy*, 488 (NY), Sept. 19, 1898, *S. M. Tracy*, 6350 (NY (ND, type of *Laciniaria vittata* Greene)), Aug. 23, 1898, *S. M. Tracy*, 4886 (US, NY), *S. M. Tracy* (US), Aug. 20, 1898, *S. M. Tracy*, 6353 (ND); in low pine clearing, Pass Christian, Sept. 1879, *A. B. Langlois* (ND, type of *Laciniaria elongata* Greene); Cuevas (albino), Sept. 8, 1900, *S. M. Tracy & F. E. Lloyd*, 579 (US).

Linnaeus, Sp. Pl. ii. 819 (1753), described *Serratula spicata* briefly as a plant with linear leaves, flowers sessile along a spike and a single stem. He based his diagnosis on a number of references, including that of Gronovius to Clayton's no. 237, from Virginia (Gron. Virg. 92 (1739)) and a Plukenet figure (Pluk. Alm. 190, t. 424, f. 6 (1696)), which is indeterminable. Of the other citations, the brief statement in Banister's catalogue (Banist. Virg. 1927 (1693)), though referring to something in the *spicata* group, is insufficient to determine the plant. Morison (Moris. Hist. iii. 137, t. 27 (1715)) quotes Banister but describes *L. squarrosa* and is cited by Linnaeus under both *L. spicata* and *L. squarrosa*, but in his second edition (1763) under *L. squarrosa* only. Dillenius' figure (Dill. Elth. 85, t. 72 (1732)) was drawn from a cultivated plant and shows a stout branching garden specimen probably similar to the plant of Gronovius. The leaves are distinctly ciliate at the base and the phyllaries are not obtuse. In the second edition, Linnaeus (Sp. Pl. ii. 1147 (1763)) added to his description of the leaves: "basi ciliatis" and likewise

referred to the second edition of Gronovius (Gron. Virg. 116 (1762)). *Liatris spicata*, as based on *Serratula spicata*, was described by Willdenow (Sp. Pl. iii. 1636 (1803)) with very little further elaboration on Linnaeus' description, except the statement that the bracts were linear and obtuse; and he again included all the same references.

There is in the Linnaean herbarium a specimen labelled *spicata*, a photograph of which Dr. Fernald kindly showed me, which Linnaeus had in 1753. It shows a plant mounted in two sections, each about 30 cm. long, with basal leaves about 9 mm. wide and an inflorescence 22 cm. long with heads almost 1 cm. long and not too crowded. Thus it agrees well with what is commonly called *Liatris spicata* as it grows in marshy places or as it is seen cultivated in flower-gardens.

Examination of a photograph of the Clayton specimen in the herbarium of the British Museum, also seen through the kindness of Dr. Fernald, shows a plant having turbinate heads with loose bracts, rather than cylindrical heads with appressed bracts. The inflorescence is of 9 heads along a short raceme or spike, about 2 cm. thick. The phyllaries appear oblong-oval. Only the uppermost leaves are present and these lengthen downward from short bracts ca. 12 mm. long subtending the basal heads to leaves about 3 cm. long. Fortunately there is also in the Gray Herbarium a small packet containing a head, labelled in Dr. Gray's hand: "*L. spicata L. Clayt.*" Examination of one floret of this showed the corolla-tube to be pilose within and the little bract subtending the head distinctly ciliate on the margin. In all these characters the Clayton specimen is quite different from that of Linnaeus and from what is now generally considered *L. spicata*, fitting rather what has been called *L. graminifolia*. The name *L. spicata*, then, is correctly based on the Linnaean specimen, exclusive of the Clayton plant and omitting that part of the description of the leaves by Linnaeus, "basi ciliatis", which probably was taken from the Clayton specimen.

Michaux (Fl. Bor. Amer. ii. 91 (1803)), citing *Serratula spicata* L. as a synonym, described *Liatris macrostachya*, as having a very long spike of sessile flowers with appressed involucral bracts. A photograph of his type seen at the Gray Herbarium agrees well with the Linnaean specimen. Pursh (Fl. ii.

507 (1814)) took up Michaux's *L. macrostachya* and brought Willdenow's *L. spicata* and Walter's *Anonymos graminifolius* into synonymy, thus confusing the identity of this long-spiked plant (see no. 7). Elliott (Sk. ii. 273 (1824)) chose Dillenius' figure to represent a variety of *L. spicata* with longer, narrower leaves and applied to it the varietal epithet *macrostachya*, taken from Michaux's species. DeCandolle (Prod. v. 130 (1836)) chose the same epithet for his var. β. Otherwise, *L. macrostachya* has been commonly regarded as synonymous with *L. spicata*, and so it seems from photographs of the type specimens it should be.

Torrey & Gray (Fl. N. Am. ii. 73 (1841)) and especially Gray (Syn. Fl. i². 111 (1884)) excluded Clayton's plant and interpreted *L. spicata* as the thick-spiked plant represented in Curtis's Bot. Mag. t. 1411 (1811), Brit. Fl. Gard. t. 49 (1823) and in the figure of Dillenius, Hort. Elth. t. 72, f. 83 (1732). As mentioned above, Dillenius' figure shows a large, branching plant of less spicate form with short leaves which are markedly ciliate at the base and probably represents a cultivated specimen of a plant similar to that of Gronovius.

Two varieties of *L. spicata* have been recognized that need to be considered here:

1. "var. β, heads about 5-flowered; plant smaller—L. resinosa Nutt., . . . not of DC." T. & G. l. c. ii. 73 (1841).
2. "var. *montana* Gray, low and stout . . . rocky mountain-tops in Virginia and N. Carolina, where it abounds." Gray, Syn. Fl. i². 111 (1884).

Referring first to the latter, there are specimens in various herbaria, of a wide-leaved, stout-stemmed but short-spiked mountain form of the Alleghanies. But from boggy places or by lakes in the mountains have come plants with very tall spikes and broad leaves, so that it has seemed faulty to include in a mountain variety only those individuals that had probably grown in more exposed and less favorable places, resulting in shorter spikes. Examination of collections from the North Carolina mountains (well represented at the National Herbarium), with study of their habitats, seems to confirm the water-loving nature of this species. Probably in dry habitats the spike often becomes reduced. So in *Biltmore Herb.*, no. 579d, from the slopes of Cedar Cliff Mt., Buncombe Co., North Carolina, one

specimen at the National and one at Queen's University Herbarium were found to be the low forms, while another specimen at the former herbarium and one at the New York Botanical Garden are hardly to be recognized as mountain specimens, resembling rather the usual var. *typica*. Those of reduced stature, if compared with those of normal var. *typica* from the same region, might represent an ecological variant or *forma*, but hardly merit varietal ranking. They have therefore been listed under var. *typica* as *f. montana*.

Nuttall, Gen. ii. 131 (1818), described a plant collected in the pine forests of North and South Carolina as *L. resinosa*, for the resiniferous glands that are sometimes conspicuous on the bracts (Type in the Banks Herbarium, a photograph of which was obtained by Mr. Weatherby). A glutinous condition of the buds of plants of var. *typica* from much further north is sometimes found, so that this characterization for a new species is not distinctive. However, the photograph of the type specimen bearing "Georgia" on the label, shows a very slender tall plant (more than three times the length of the herbarium sheet) with narrow long leaves and rather narrower lanceolate phyllaries. Furthermore, others have described what appear to be variants in the South of the tall-spiked plant of open swamps. Bertoloni, Misc. Bot. v. 10, t. 2 (1846), saw something new in slender plants collected in Alabama by *Gates* (isotypes in G, NY, and B) and named them *L. sessiliflora*. Greene, Pittonia iv. 315 (1901), also described *L. vittata* from a specimen from Mississippi, *S. M. Tracy*, no. 6350, near Biloxi, Harrison Co. Sept. 19, 1898 (ND). After examination of many specimens we have united these three as var. *resinosa* of *Liatris spicata*. The slenderer form, with long narrow leaves and fewer-flowered heads, has a more southern range, occurring southward chiefly from Virginia and Tennessee to Georgia, Florida and Alabama, in regions that may during the summer season become dry barrens. In Virginia and the Carolinas it is unusual to find *L. spicata* var. *typica* except near the mountain lakes, while the slender extreme is abundant, and is still more so in Georgia, Alabama and Florida, though both varieties occur. There are, of course, small differences in height, length of leaves and density of spike, in specimens from different localities throughout the entire range of the species, but generally

the southern extreme with narrow leaves and slender spike of 4–7-flowered heads having corolla-tubes without any pilosity, makes a true variety of *L. spicata*. In the northern latitudes of its range, when a specimen has grown in a location unfavorable for this marsh-loving species, the size of the heads and phyllaries and the thickness of the spike are often reduced so that one is reminded of specimens from Carolina, though the same long, narrow basal leaves may not accompany such depauperate forms. In most of the states where this slenderer variety and the thick-stemmed var. *typica* both occur there are present some confusing intermediates, frequently with very narrow leaves and yet larger heads of 12 and more flowers. Of these I have listed some below. Sometimes collections of the same collector's number and date comprise both varieties; as *A. H. Curtiss*, no. 6923, from boggy places near Argyle, Walton Co., Florida, Oct. 2, 1901, which at the National and Queen's Herbaria favor var. *resinosa* and at Gray var. *typica;* or *R. M. Harper*, no. 1652, from moist pine barrens between Moultrie and Kingwood, Colquitt Co., Georgia, Sept. 27, 1902, which at the New York Botanical Garden favors var. *typica* and at Gray and the National Herbaria var. *resinosa*. Intermediates seem frequently to occur in Florida. Likewise, some southern specimens suggest a variation in their long narrow phyllaries and very tall spikes, as *Biltmore Herb.*, no. 579m, from a swamp near Albertville, Marshall Co., Alabama, July 10, 1899 (NY). This kind of specimen was described by Greene (Pittonia, v. 57 (1902)) as *Laciniaria elongata*, type, *A. B. Langlois*, low pine-barrens at Pass Christian, Harrison Co., Mississippi, Sept., 1876 (ND). We have included all such under the one variety *resinosa*.

Intermediates between *L. spicata* var. *typica* and var. *resinosa*. —VIRGINIA. SUSSEX Co.: moist pinelands just southeast of Waverly, Sept. 10, 1937, *Fernald & Long*, 7660 (G). NORTH CAROLINA. DUPLIN Co.: savannah, 8 mi. west of Richland, Aug. 6, 1938, *R. K. Godfrey*, 5861 (G). CARTERET Co.: pineland near sea-level, Sept. 1, 1938. *Godfrey*, 6405 (G). PENDER Co.: savannah near Burgaw, Aug. 7, 1938, *Godfrey*, 5922 (G). GEORGIA. WARREN Co.: Warrentown, July 24, 1910, *Biltmore Herb.* 579g (NY, US). FLORIDA. DUVAL Co.: moist pine-barrens near Jacksonville, Nov., *A. H. Curtiss* 1178 (G, NY). WAKULLA Co.: St. Marks, Sept. 3, 1895, *G. V. Nash* 2542 (G, NY, US, ND). VOLUSIA Co.: Deland Road, near

Daytona Beach, Aug. 16, 1943, *Mrs. H. T. Butts* (G, OA). ALABAMA. Cullman Co.: Cullman, July 24, 1900, *Biltmore Herb.* 579f (US).

The few native specimens of this complex from Louisiana which have been seen resemble var. *resinosa* rather than var. *typica* but they are quite pubescent. Of two specimens, Aug. 11, 1919, and Sept. 1, 1922, Bro. *G. Arsène*, no. 11207 and no. 12517 respectively, from Sulphur Springs, vicinity of Covington, St. Tammany Parish (US), the latter is similar to var. *resinosa* with a moderately hirsute stem, while the former is more densely so. A very hirsute condition does not usually go with *L. spicata*. Deam (Flora of Indiana, p. 912) states: "The rachis of all my plants is quite glabrous. Kriebel's no. 3958, from Greene Co., has the rachis closely puberulent". In the examination of many specimens pubescence has but rarely been encountered elsewhere. Of the three Gates specimens from Alabama, which are the isotypes of Bertoloni's *L. sessiliflora*, the one at the Gray Herbarium is the only one to have hirsute foliage; it was mentioned by Gray (Synop. Fl. i^2. 111 (1884)). Also on two sheets of collections from the Carolinas, both hirsute as well as glabrous plants are found; Aug. 29, 1938, *R. K. Godfrey*, no. 6253 from pineland near Hallsboro, Columbus Co., N. C. (G), and Sept. 11, 1939, *R. K. Godfrey*, no. 8182, 2 mis. w. of Jamestown, Berkeley Co., S. C. (G). In the recently seen herbarium of the University of Florida, in which are represented collections from eighteen counties of that state, variations from a few scattered cilia at the base of the leaves to densely pilose leaves and stems were found in four specimens from Alachua county and one each from Dixie, Union, Manatee and Leon counties. Since such varying degrees of pubescence were witnessed in plants from one locality it seemed that exceptional hirsute individuals of the generally glabrous *L. spicata* must be included in var. *resinosa*. *L. Garberi*, which is the truly hirsute species of the series *Spicatae*, occurs in the southern half of the peninsula, beginning to appear just about where *L. spicata* leaves off.

Greene (Pittonia, iv. 315–16 (1901)) described *Laciniaria serotina* from a specimen of *A. B. Langlois*, Nov. 8, 1885, from Covington, St. Tammany, Louisiana (ND), as a plant with a slender stem covered with hairs and having ovate outer phyllaries with

ciliate margins and inner oblong ones with acute tips. It is of course possible that a few such mutations might occasionally arise. However, examination of a specimen of Aug. 20, 1903, *S. M. Tracy*, no. 8533, from Mendenhall, Mississippi (G, T) which resembles *L. pycnostachya* but shows only slightly recurved bracts while in other respects it is almost a match for the Louisiana *resinosa*-like plants, suggests that these may represent intergrades with another species, as *L. pycnostachya*. They seem to make a series of intermediates between typical southern *L. spicata*, as can be seen in the Gates specimen (G, NY, B) or that of Oct. 30, 1903, of *S. M. Tracy*, no. 8567, from Gateswood, Baldwin Co., Alabama (G, NY, US, T), and *L. pycnostachya* Michx. (see no. 6). The suggestion of some hybridity seems more plausible since in Florida some plants approaching these have slightly ciliolate bracts and also pilosity in the corolla-tube, which is lacking in *L. spicata* but present in members of the *Graminifoliae* series. Such is a specimen of Oct. 8, 1930, *F. S. Blanton & H. O'Neill*, no. 6820, from low pineland, at edge of swamp, 10 mis. n. w. of Antioch, Pasco Co., Florida (US). In another collection of Sept. 3, 1895, of *G. V. Nash* no. 2542, from St. Marks, Wakulla Co., Florida, the specimen at the New York Botanical Garden has a hairy corolla and the one at Notre Dame is smooth. Until more specimens have been collected that would confirm recognizing the pubescent plants as a distinct species or variety we have considered them here as exceptional or as intermediates; and this includes Greene's *Laciniaria serotina* which is left under the doubtful species.

There is also some evidence in the southeastern coastal plain, as from south Maryland to Georgia where representatives of the *Graminifoliae* abound, that intergrades between them and *L. spicata* may occur. The collection of Oct. 4, 1929, *J. H. Pyron*, from Princeton, Clarke Co., Georgia (P) which has a stalk 93 cm. tall, with long slender leaves and a spike 2.5 cm. in diameter, has heads a little turbinate and corolla-tube slightly hairy, similar to *L. graminifolia*. A similar specimen of Sept. 15, 1916, Bro. *F. Hyacinth*, no. 950, Amendale, Prince George Co., Maryland (P), is another that looks tall and stiff like *L. spicata* and yet has a hairy corolla-tube. A specimen of Oct. 11, 1912, *F. W. Pennell*, no. 4852, from sandy pineland, Yemassee, Hampton Co., South

Carolina (NY, P), while resembling the southern *L. spicata* var. *resinosa* in general, shows a hairy corolla and acute bracts that suggest *L. regimontis*.

A modified specimen, such as that described by Farwell as *Lacinaria spicata* var. *foliacea* (Amer. Mid. Nat. ix. 260 (1925)), was found by the writer when collectiong on Squirrel Is., in the St. Clair River, Lambton Co., Ontario, and is considered to be the result of a plant of var. *typica*, found there at the northern limit of its range, having had the spike broken when young, perhaps by grazing cattle, thus stimulating greater growth of the remaining basal heads, their pedicels and the subtending bracts.

In this species also, the white-flowered form seems to have been noticed fairly frequently and was first recognized as *Liatris spicata* forma *albiflora* by Britton (Bull. Torr. Bot. Club, xvii. 124 (1890)), but as the albino has occurred in many of the other species, no special recognition of it is here made.

Hereafter is described a hybrid from the northern limit of the range of *L. spicata* var. *typica*.

× Liatris **Steelei,** hybr. nov. (*L. spicata* × *sphaeroidea*), caulibus erectis glabris ca. 8.5 dm. altis e cormo compresso 3 cm. lato 2 cm. alto; foliis radicalibus argute lanceolatis 36 cm. longis 2 cm. latis, petiolo anguste alato longitudine tertiam partem laminae aequante, foliis caulinis basem versus radicalibus similibus ca. 20 cm. longis, superne ad folia lineari-lanceolata vel linearia 10–1 cm. longa 3–1 mm. lata abrupte reductis; inflorescentia e spica laxa 20–40 cm. longa; capitulis 20–25-floris sessilibus vel breviter pedicellatis 1–1.5 cm. longis anthesi 1–1.2 cm. latis tunc subturbinatis; phyllariis glabris plerumque herbaceis, exterioribus ovatis vel oblongis marginibus scariosis angustis, medianis interioribusque oblongo-linearibus apice rotundato conspicue scarioso coloratoque; corolla purpurea, tubo 7 mm. longo intus piloso; achaeniis 5 mm. longis, pappo barbellato 6 mm. longo.—INDIANA. Porter Co.: on and among dunes, Dune Park (alt. 175–200 m.), Sept. 17, 1909, *E. S. Steele* 169 (US 609031, type, 609030, isotype).

These two plants were observed to resemble *L. spicata* var. *typica* but to vary in their larger heads of more flowers and broader phyllaries with scarious, rather crisped margins. The leaves too are sharply lanceolate rather than linear-lanceolate as found in that species.

These variations in characters suggested relationship to mem-

bers of the *Scariosae* series and a search was made through the Steele collection. A specimen of × *L. sphaeroidea*, collected at the same time and place was discovered—no. 162b (US609017). As other specimens of this latter hybrid have come from this region of Indiana it seems quite likely that they represent one parent of the new hybrid. As discussed (see no. 18) × *L. sphaeroidea* has come to be quite a stable unit and has probably been a parent of other hybrids as well. Though no specimen of *L. spicata* from the very same location was found, in the collection there is, surprisingly enough, one of Sept. 20, 1909, of E. S. Steele, no. 181, from the old beaches, Lake Chicago, Buffington to Pine, Lake Co., Indiana (US 609098), with the typical, long, linear leaves and usual heads of about 10 flowers of *L. spicata*. Thus presumably the second parent-species grew at least in the region and perhaps even in the near-by vicinity at the time of collection of the hybrid plants.

2. Liatris lancifolia (Greene) Kittell. A thick-stemmed glabrous plant 6 dm. high resembling *L. spicata* var. *typica:* leaves numerous; basal ones 2–3 dm. long and 1–1.5 cm. wide in the center from which they taper equally to the base and obtuse tip; upper leaves shorter and bluntly lanceolate: inflorescence a dense or loose spike 1.5–3 dm. in length and 2–3 cm. in diam.; heads ca. 12-flowered; phyllaries erect, glabrous, the outer triangular-ovate, the inner oblong and acute, mostly herbaceous, with narrow purplish ciliolate margins; corolla purple, 6 mm. long, smooth within; achene (immature) at least 3 mm. long; pappus 5 mm. long.—Tidestr. & Kittell, Fl. Arizona and New Mexico, 370 (1941). *Laciniaria lancifolia* Greene, Bull. Torr. Bot. Club xxv. 118 (1898). *Lacinaria kansana* Britt., Man. 927 (1901). *Liatris kansana* Rydb., Fl. Prairies & Plains Central N. Amer. 781 (1932).

Along river-bottoms from S. Dakota to Colorado and in the mountains of New Mexico.—STATE UNDETERMINED. *J. D. Cooper* (NY). SOUTH DAKOTA. Union Co.: Wallace, Aug. 16, 1892, *S. Dak. Agr. Exp. Sta.* (US). NEBRASKA. Co. Undetermined: Aug. 9, 1899, *J. H. Holms* (US). Keyapah Co.: Carns, Aug. 18, 1893, *F. Clements*, 2892 (G, US). Scottsbluff Co.: Platte Bottom, w. of Scottsbluff, Aug. 3, 1891, *P. A. Rydberg*, 139 (NY, US). Kearney Co.: Platte Valley at Fort Kearney, July 1891, *H. Hapeman* (US). KANSAS. Riley Co.: prairie, Aug. 7, 1895, *J. B. Norton*, 215 (G, NY, US). Ford Co.: bottoms, south of river, Dodge City, Aug. 19, 1890, *B. B. Smyth*, 163 (NY, type of *Lacinaria kansana* Britt., US). WYOMING.

Goshen Co.: moist meadows, Pratt, Aug. 1912, *A. Nelson*, 9667 (G). COLORADO. Co. Undetermined: Platte,[1] *Fremont* (NY). Yuma Co.: Wray, Aug. 16, 1907, *H. L. Shantz* (NY). NEW MEXICO. Chaves Co.: Roswell, South Spring R. (alt. 3800′), Aug. 25, 1900, *F. S. Earle & E. S. Earle*, 258 (NY, US); Roswell, South Spring R., Aug. 25, 1900, *F. S. Earle* (ND). Lincoln Co.: in marshy land, south fork of Tularosa Creek, White Mts. (alt. 6800′), July 31, 1897, *E. O. Wooton*, 254 (G, NY (ND type)). Otero Co.: along Tularosa Creek, Aug. 18, 1899, Aug. 6, 1901, *E. O. Wooton* (US); Tularosa Creek, 3 mis. s. of Mescalera agency, July 19, 1928, *C. B. Wolf*, 2795 (G); rather swampy meadows, Mescalera Indian Reserv., Aug. 2, 1931, *W. Huber* (P).

Essentially the same basic characteristics are common to *L. spicata* var. *typica* found in the states east of the Mississippi and to *L. lancifolia* which was described from marshy land in the White Mountains of New Mexico. The width of the leaves of the latter, described by Greene, l. c. as "broad in proportion", is somewhat unusual for a member of the *Spicatae* series, though similar to *L. spicata* var. *typica* f. *montana*. *Lacinaria kansana* Britt. was described from a plant from river-bottoms in Kansas as having also blunter leaves. Rydberg l. c. treated *Liatris kansana* as a species occurring rather infrequently from S. Dakota to Colorado, i. e. in the western plains states.

When the New Mexico specimens are compared with those of the neighboring plains and allowance is made for some modification due to mountain habitats, the forms seem hardly distinguishable. In both, the corolla-tube is smooth within so that one might consider these geographically separated segregates as varieties of *L. spicata* but for their separation by the expanse of the central plains states from the rest of that species. We are here considering the two as one species, *L. lancifolia* (Greene) Kittell.

The species is readily separated from *L. pycnostachya* Michx., a common species in the western plains, by the appressed rather than recurved phyllaries. Occasional material is suggestive of a condition intermediate between the two, as the collection of 1861, *T. J. Hale*, Trempealeau, Trempealeau Co., Wisc. (G), with acute and ciliate-margined though erect phyllaries or those

[1] In the Report of Fremont's Expedition, Washington, 1845, the reference on page 90 of the Catalogue of Plants to "L. spicata (Willd.) north fork of the Platte Sept. 4" is probably to this specimen.

of Aug., 1892, *ex Herb. J. J. Thornber*, Brookings, Brookings Co., S. Dak. (G), and of Sept. 3, 1891, *ex Herb. J. M. Bates*, Valentine, Cherry Co., Neb. (G), both having phyllaries that, though not recurved, are loose rather than appressed and have petaloid margins. As there was some pilosity within the corolla-tubes, confirmation of intergradation is given and may even suggest that it be between *L. lancifolia* and some species of the plains other than *L. pycnostachya* since that usually shows none or very few hairs in the tube.

3. LIATRIS MICROCEPHALA (Small) K. Sch. Stems commonly tufted, slender, striate, glabrous, 3–7 dm. tall, from a small ovoid or subglobose corm, usually not more than 3 cm. in diameter; leaves numerous, linear, glabrous with very few hairs along mid-vein or margin, the basal 5–10 cm. long, 2–3 mm. wide, the upper gradually reduced to the base of the inflorescence: heads in lax slender racemes, quite numerous, 4–6-flowered, cylindrical, somewhat narrowed, but not acutely, at the tips, ca. 8 mm. long, slender, on short, slender, erect peduncles about equalling them in length; phyllaries glabrous, appressed, obtuse, the outer ovate, the inner oblong, with only minutely ciliolate or merely slightly scarious margins, 5–6 mm. long: corolla-tube 5–6 mm. long, purple, lacking any pilosity within; achenes 3–4 mm. long; pappus short, 3.5–4 mm. long, about half as long as the corolla-tube, not plumose to the naked eye (i. e. with barbellate bristles). —Just, Bot. Jahresb. xxvi. pt. 1, 378 (1900). *Lacinaria microcephala* Small, Bull. Torr. Bot. Club xxv. 473 (1898); Man. S. E. Fl. 1334 (1933). *Laciniaria polyphylla* Small, Fl. Southeastern U. S. 1173, 1338 (1903).

On sandstone outcrops and dry barrens in North Carolina, Tennessee, Kentucky, Georgia and Alabama.—NORTH CAROLINA. POLK Co.: Tryon, near Columbus, Aug. 4, 1897, *E. C. Townsend* (US); Tryon, Aug. 11, 1921, *D. C. Peattie*, 1154 (NC). HENDERSON Co.: Flat Rock, Aug. 24, 1881, *J. Donnell Smith* (NY). GEORGIA. Co. UNDETERMINED: in shade of mountains, 1836, *Drummond*, 173 (NY). RABUN Co.: canyon, Tallulah Falls (alt. 1600′), Aug. 16, 1893, *J. K. Small* (G, NY, US). DE KALB Co.: on slopes and summit of Stone Mt. (alt. 1000′–1686′), Sept. 6–12, 1894, *J. K. Small* (G (NY, type of *Laciniaria polyphylla* Small), US); Stone Mt., *Biltmore Herb.* Sept. 8, 1897 (No. 4117a), Sept. 1, 1899 (No. 14936a) (NY); Stone Mt.; *L. R. Gibbes* (NY), Sept. 1876, *W. M. Canby* (G); turf, rocks, n. w. base of Stone Mt., Aug. 17, 1927, *K. M. Wiegand & W. E. Manning*, 3175 (G); rocky soil, Aug. 2, 1912, *F. W. Pennell*, 4064 (US, P). ROCKDALE Co.: 6 mis. s. w. of Logansville, Big Haynes Cr., Oct. 18, 1936, *J. H. Pyron & R.*

McVaugh, 1126 (US). KENTUCKY. Co. UNDETERMINED: Mts. of Kentucky, Lexington, 1837, *C. W. Short* (NY). Mc CREARY Co.: on sandstone and sand, along South Fork, Cumberland R., Sept. 16, 1934, *E. Lucy Braun* (G); along sandy shores of Upper Cumberland R., Sept. 13, 1940, *F. T. McFarland & H. J. Rogers*, 88 (G). TENNESSEE. Co. UNDETERMINED: on rock, e. Tenn. MacFarlands, *A. Ruth*, 1896 (No. 3762), 1897 (No. 5804) (NY). DAVIDSON Co.: Nashville, 1878, *Dr. A. Gattinger* (P). MORGAN Co.: sandy margin of stream, Rugby, Aug. 19, 1930, *H. K. Svenson*, 4094 (G, P, B); moist sandy glade, n. of Hoffman, Sept. 11, 1927, *E. T. Wherry & F. W. Pennell*, 13942 (P). COCKE Co.: 3 mis. s. of Wolf Creek Sta., Aug. 30, 1897, *T. H. Kearney*, 746 (US). CUMBERLAND Co.: gravelly oak woods, 6 mis. e. of Crossville, Aug. 15, 1930, *H. K. Svenson*, 4173 (G, B); Ozone, July 14, 1929, *W. A. Anderson*, 1402 (G), *H. M. Jennison & W. A. Anderson* (G, O without No.); sandy soil, mountain-top, Aug. 24, 1890, *D. C. Coffman* (US). VAN BUREN Co.: dry sandy ledge, bluff overlooking Can Creek Falls, July 19, 1935, *J. K. U. Sharp & A. J. Sharp*, 2955 (P). COFFEE Co.: dry oak-barrens, n. of Manchester, *H. K. Svenson*, Aug. 6, 1938 (No. 8987) (G, B), Aug. 8, 1940 (No. 10607) (B); near Tullahoma, Sept. 24, 1933, *E. J. Alexander, T. H. Everett & S. D. Pearson* (NY). FRANKLIN Co.: Sewanee, 1897, *K. Selden*, 311 (NY, F); sandstone rocks, St. Andrews, July 15, 1938, *H. K. Svenson*, 9583 (G, B). ALABAMA. Co. UNDETERMINED: in tufts on rocks, on the summit of mts., July 29, 1896, *C. Mohr* (US). DE KALB Co.: falls, above Valley Head, Sept. 20, 1899, *Biltmore Herb.*, 14936b (NY). MARSHALL Co.: rocky glades, along Short Creek, 5 mis. n. e. of Boaz, Aug. 29, 1933, *R. M. Harper*, 3103 (G, NY, P, US). ETOWAH Co.: on sandstone rocks, above Noccalula Falls, Lookout Mt., Aug. 31, 1911, *R. M. Harper*, 149 (G, NY, US). CULLMAN Co.: Cullman, Sept. 9, 1897, *H. Eggert* (NY, ND, US); rocky glade, St. Bernard, Sept. 15, 1937, *Rev. Gattman* (NY, P). CALHOUN Co.: on granitic rocks, dry hills, near Anniston & Chandler Springs, Sept. 20, 1892, *C. Mohr* (US). TALLEDEGA Co.: Blue Mts., Sept. 24, 1893, *C. Mohr* (NY). AUTAUGA Co.: flat pine-woods, n. e. of Autaugaville, Aug. 31, 1930, *R. M. Harper* (G, P); dry gravelly banks in open exposed places, banks of Autauga Creek, near Prattville, July 18, 1880, *C. Mohr* (US). MONROE Co.: in mts., near Franklin, 1843, *Rugel* (NY).

Although fire in the Herbarium of the University of Tennessee destroyed the type from which Small described *Lacinaria microcephala* (Dr. A. Gattinger 1888, in the Cumberland Mts. Tennessee), observation of many specimens from this region in various herbaria confirms its identity as a distinctive species.

Liatris microcephala has been frequently confused with *L. graminifolia*, probably because of a general similarity in size of plant and the somewhat similar distribution of heads. However, the prominent cilia found along the margins of the petiole in the latter species are lacking in the almost glabrous leaves of *L. microcephala*. The number of flowers in a head are also much fewer in this species and make a slender cylindrical head, whereas in *L. graminifolia* the head is thickened in bud and becomes more turbinate upon opening. Upon examination of the corolla-tube with a lens it is found to be clear in *L. microcephala*, as in *L. spicata*, whereas in *L. graminifolia* considerable pilosity is seen. It is by these characters that *L. microcephala* has been placed with the *Spicatae* rather than with the *Graminifoliae*.

4. LIATRIS ACIDOTA Engelm. & Gray. Corm globose or slightly elongated, usually not more than 3 cm. in diameter, bearing a tuft of fibres, the remnants of previous basal leaves, as seen also in *L. spicata* and *L. pycnostachya:* stems slender but stiffly erect, 5–8 dm. tall, glabrous or puberulent, arising singly in young, but to the number of three or four in older plants: basal leaves very long, glabrous, linear-lanceolate, 2–4 dm. long, 3–5 mm. wide, those of the slender spikes narrowly linear becoming abruptly shortened, erect and bract-like: heads numerous, loosely covering 10–20 cm. of the erect spikes, 3–5-flowered, cylindrical but narrowed acutely at the tip when in bud, about 1 cm. long; phyllaries few, glabrous, appressed, the outer ovate, the inner oblong-lanceolate, sometimes becoming purplish; corolla about 8–10 mm. long, phlox purple, lacking any pilosity within the tube; achene 4–5 mm. long; pappus ca. 7 mm. long, not plumose to the naked eye (i. e. with barbellate bristles).—Pl. Lindh. i. 10 (1845); Boston Jour. Nat. Hist. v. 218 (1845); Gray, Pl. Wright. i. 83 (1852), in part. *L. mucronata* sensu Torr. & Gray Fl. N. Am. ii. 70 (1841) not DC. *Lacinaria acidota* O. Ktze., Rev. Gen. i. 349 (1891); Bush, Amer. Mid. Nat. xii. 318 (1931). *Lacinaria Halei* Small, Bull. Torr. Bot. Club, xxvii. 281 (1900). *Liatris acidota* var. *vernalis* Engelm. & Gray, Pl. Lindh. i. 10 (1845). Probably *Lacinaria brachyphylla* Bush, Amer. Mid. Nat. xii. 317 (1931).

Coastal plain region of Texas and Louisiana.—TEXAS. Without stated locality: 1843, *Lindheimer*, 73 (G); Apr. 1842, *Lindheimer* (P); Sept. 1842, *Lindheimer* (G); 1836, *Drummond*, 171 (G, paratype), *Drummond*, 146 (G, paratype); *C. Wright* (G, P), 155 (US); Sept. 1850, *G. Thurber* (G, NY, P). Co. undetermined: wet prairies, Houston to the Brazos, 1843, *Lindheimer*, 72 (G, type) (P). TRINITY Co.: 4 mis. e. of Riverside, Sept.

29, 1934, *V. L. Cory*, 10476 (G). Newton Co.: 16 mis. s. of Newton, Oct. 4, 1934, *V. L. Cory*, 10966 (G, US); 21 mis. n. of Dewbeyville, Oct. 4, 1934, *V. L. Cory*, 10966 (G). Hardin Co.: 2.6 mis. e. of Camp Jackson, Sept. 13, 1936, *V. L. Cory*, 19799 (G, T); 7 mis. n. of Silsbee, *V. L. Cory*, 20036 (G); Kountze, Aug. 5, 1939, *H. R. Reed*, 30 (G). Tyler Co.: without stated locality, July 22, 1939, *B. C. Tharp* (G). Liberty Co.: Stilson, Sept. 3, 1923, *B. C. Tharp*, 2633 (US); Cleveland to Dayton, Sept. 9, 1937, *B. C. Tharp* (G). Harris Co.: pine woods, Houston, Aug. 9, 1921, *R. Ferris & C. D. Duncan*, 3266 (NY, P); Houston, July 23, 1915, *G. L. Fisher*, 1720 (US); Houston (specimen to right), 1915, *E. J. Palmer*, 8577 (P): Bammel Ranch (very abundant), July 18, 1925, Oct. 1, 1925, *H. Ness* (T); prairies, Harrisburg, 1874, *J. F. Joor* (US); Harrisburg, Sept. 2, 1875, Oct. 1894, *J. F. Joor* (US); Seabrook, Aug. 11, 1913, *G. L. Fisher*, 663 (US). Waller Co.: without stated locality, Aug. 14, 1898, *F. W. Thurow*, 12 (US). Austin Co.: without stated locality, Oct. 15, 1939, *B. C. Tharp* (G). Jefferson Co.: Vidor, Sept. 1, 1923, *B. C. Tharp*, 2641 (US). Chambers Co.: coastal prairies, Sept. 3, 1924, *B. C. Tharp*, 3179, 3180 (US). Galveston Co.: 13 mis. n. w. of Galveston, Aug. 4, 1939, *H. R. Reed*, 28 (G). Brazoria Co.: 12 mis. s. of Alvin, Dec. 6, 1918, *H. C. Hanson* (NY, P). Matagorda Co.: moist sandy soil, along Rwy. s. of Van Vleck, Sept. 20, 1913, *F. W. Pennell*, 5512 (NY, P); 6.8 mis. w. of Palacios, Oct. 18, 1936, *V. L. Cory*, 20279 (G). Jackson Co.: Edna, Dec. 9, 1930, *J. A. Drushel*, 6847 (US); El Toro, Nov. 11, 1931, *J. A. Drushel*, 8837 (US). Calhoun Co.: Port Lavaca, July 2, 1939, *B. C. Tharp* (G). LOUISIANA. Without stated locality: *Hale*, 334 ((G, unnumbered), (NY, type of *Lacinaria Halei* Small) P). Calcasieu Co.: low moist grassy field, along Rwy., 1 mi. e. of Lake Charles, July 20, 1938, *D. S. Correll & H. B. Correll*, 9638 (G); Lake Charles, Aug. 25–Sept. 10, 1938, *K. K. Mackenzie*, 475 (NY, P); Lake Charles, Aug. 7, 1897, *S. M. Tracy*, 3448 (NY, P); Lake Charles, Sept. 1906, *R. S. Cocks*, 2922 (ND).

Liatris acidota was described by Engelmann and Gray in 1845 (Pl. Lindh. i. 10), when they distinguished it from De Candolle's earlier species *L. mucronata* (Prodr. v. 129 (1836)). However, the two species are still confused and sometimes as well with *L. punctata*.

The type of *L. mucronata* is a plant collected Nov. to Dec., 1828, by Berlandier, no. 1926, in Texas (Herb. Geneva; isotypes in G, NY). Torrey & Gray (Fl. N. Amer. ii. 70 (1841)) maintained *L. mucronata* and referred to it other specimens collected by Drummond, no. 171, and no. 146, from Texas (G), and by

Hale from Louisiana (G, NY). When Engelmann and Gray described *L. acidota* from a plant of Lindheimer's collections, no. 72, from wet prairies, Houston to the Brazos (G, NY), they selected as similar to it, the Drummond and Hale specimens. A spring-blooming plant collected by Lindheimer, no. 73, near Houston (G), was made *L. acidota* var. *vernalis*. However, they recognized their species as distinct from De Candolle's and wrote (l. c. page 10) as follows:

"In the Flora of North America, this species, which is apparently common in western Louisiana and Texas, was hesitatingly referred to *L. mucronata* DC., from the character of which it differs in some respects, principally in the form of the involucral scales. But among Lindheimer's plants, some specimens of what is no doubt the true *L. mucronata* DC. occur (which have been distributed in some sets probably mixed with *L. acidota*) and which render it clear that the present is a different, although very nearly allied species".

Then in Gray, Synop. Fl. i^2. 110 (1884), *L. acidota* was retained, not in the sense of Engelmann & Gray, but of *L. mucronata* of Torrey & Gray. True *L. mucronata* was reduced to a variety, to which other Texas plants were referred. Specimens collected in 1849 by Lindheimer, no. 940, in the neighborhood of Comanche Spring and in 1850, no. 941 at New Braunfels, were so named in the 18th report of the Missouri Botanical Garden (1907). Thus there was continued an association of *L. mucronata* and *L. acidota* that is hardly justifiable when the type specimens are examined. De Candolle in describing *L. mucronata* referred only to Berlandier's specimen which, by following the route travelled by Berlandier (Geiser, Naturalists of the Frontier, Chap. III (1937)), was probably collected between Boerne and Comfort, in what is now Kerr and Kendall counties, of the blackland prairie region of Texas. Engelmann and Gray stated clearly, when describing *L. acidota*, that it came from the wet prairies "from Houston to the Brazos" (in the case of Lindheimer's plant), "western Louisiana" (in the case of Dr. Hale's plant); and, as Drummond's letters to Hooker (Hook, Journ. Bot. i. (1835)) indicate that Drummond spent most of his time collecting in a region inland from Galveston, that plant too would have come from the wet coastal plain region. All the specimens I

have seen that conform to the type of *L. acidota* have come from the coastal plain area.

The authors' original descriptions further differentiate the two species:

	L. acidota	*L. mucronata*
spike:	elongate, strict	strict
heads:	3-flowered	5-flowered
bracts:	oblong-lanceolate, outer ovate, gradually becoming acuminate, cuspidate	ciliate, obtuse, abruptly mucronate

Further examination of the specimens emphasize such differences as these:

height:	4–6 dm.	3–4 dm.
rachis:	glabrous, almost naked	leafy
basal leaves:	very elongate, diminishing abruptly	not noticeably longer and gradually diminishing
upper leaves:	erect, short, almost subulate bracts	progressively shorter leaves
corolla tube:	smooth inside	pilose within
pappus:	not plumose to the naked eye (i. e. with short lateral cilia)	plumose to the naked eye
achene:	3 mm. long	5 mm. long

Thus it seems that by the nature of the pappus alone the two species fall each into a different section of the genus, *L. acidota* in *Suprago*, and *L. mucronata* in *Euliatris*. Not only to this latter section but also to the same *Punctatae* series, belongs *L. angustifolia* Bush, and in the discussion of that species (see no. 27) will be found further reference to the confusion of *L. acidota*-like plants with *L. mucronata* and *L. angustifolia*.

In 1900 Small described *Lacinaria Halei*, from Dr. Hale's no. 334, from Louisiana (NY), stating: "This species has heretofore been included in *Lacinaria acidota*, with which it has little or nothing in common and it may be separated by its fewer leaves and much smaller heads which are disposed in elongated interrupted spikes". It would seem that by this time the erroneous synonymy of *L. mucronata* and *L. acidota* had led to such confusion that plants of the blacklands and prairies were referred to as *L. acidota* and Small made a second attempt to give the slender coastal plain plant its own rating as *Lacinaria Halei*. However the name *Liatris acidota* Engelm. & Gray can be taken up for it.

Bush (Amer. Mid. Nat. xii. 318 (1931)), in attempting to clarify *L. acidota*, made a comparison of a great many sheets of

so-called *L. acidota* and *L. punctata* and included in *L. acidota* only specimens from the coastal plain region of Texas and Western Louisiana. Among them he included one of Aug. 25–Sept. 10, 1898, collected by K. K. Mackenzie, no. 475, in low prairies at Lake Charles, Louisiana. I have seen duplicates of this specimen at the New York Botanical Garden and the Philadelphia Academy of Sciences and, finding them similar to the type plant, am agreeing with his interpretation.

L. acidota, as here interpreted, shows in common with the other species of the *Spicatae* series (except *L. microcephala*) the tall spicate form and non-pilose corolla, as well as a preference for moist habitats.

5. LIATRIS GARBERI A. Gray. From clustered, elongate, thickened, tuberous roots that spread out in a somewhat fingeroid manner from the crown of the plant; stems one to several in older plants, hirsute and 3–5 dm. high: basal leaves linear, 1–2 dm. long, ca. 5 mm. wide, almost glabrous but with cilia along the margin of the lower half that narrows into a clasping petiole; upper ones reduced from the base of the spike as they are in *L. spicata:* heads 6–7-flowered, 8–15 mm. long, cylindrical and somewhat narrowed at the tip; phyllaries appressed, viscid-hirsute, ovate to lanceolate and acuminate- to mucronate-tipped, though not sharply, mostly entire but thin on the margins, sometimes ciliate; corolla tube 7–9 mm. long, smooth inside (i. e. lacking any pilosity), and phlox-purple; achene ca. 3 mm. long; pappus 6–7 mm. long, barbellate.—Proc. Amer. Acad. xv. 48 (1880). *Laciniaria Garberi* O. Ktze. Rev. Gen. i. 349 (1891); Small, Man. S. E. Fl. 1333 (1933). *Laciniaria Nashii* Small, Fl. S. E. U. S. 1175, 1338 (1903). *Laciniaria chlorolepis* Small, Man. S. E. Fl. 1333 (1933).

Low pinelands and damp flatwoods in the southern half of peninsular Florida.—FLORIDA. Without stated locality: 1842–49, *F. Rugel* (US). Co. undetermined: s. Florida, *A. P. Garber* (G, type). ORANGE Co.: St. John's River flats, Aug. 3, 1935, *L. H. Bailey & H. H. Hume* (F). HILLSBOROUGH Co.: Tampa, Sept. 1877, *A. P. Garber* ((NY, type of *Laciniaria chlorolepis* Small.), P (specimen to right), US); near Tampa, Nov. 19, 1928, *Mrs. C. A. Miles* (NY); Tampa, Aug. 25, 1903, *N. L. Britton & P. Wilson*, 35 (NY); low pinelands, s. of Riverview, Aug. 22, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10605 (NY). BREVARD Co.: low open meadow, Melbourne, Sept. 24, 1927, *O. F. Burger & E. West* (F). INDIAN RIVER Co.: damp grassy prairie, halfway between Fellsmere and Sebastian, Aug. 13, 1925, *R. M. Harper*, 53 (G, NY). MANATEE Co.: Palmetto, Aug. 21–

23, 1895, *G. V. Nash*, 2430 (G, NY, P, ND, F); Bradentown, July 5, 1900, *S. M. Tracy*, 7078 (G, NY, US); pinelands, near Salt Springs, Myakka Pen., Aug. 27, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10612 (NY); flatwoods, Bradentown, Sept. 17, 1916, *A. Cuthbert* (F); flatwoods, Bradentown, Sept. 16, 1916, *A. Cuthbert* (F). SARASOTA Co.: flatwoods, 10 miles south of Venice, Aug. 18, 1945, *L. O. Gaiser, Mrs. H. T. Butts & Miss L. Arnold* (F). CHARLOTTE Co.: flatwoods ditch, s. of Punta Gorda, Aug. 18, 1945, *L. O. Gaiser, Mrs. H. T. Butts & Miss L. Arnold* (F). PALM BEACH Co.: low flatwoods, 5 mis. w. of Lake Worth, Aug. 27, 1943, *E. West* (F). HENDRY Co.: in low pineland, ½ mi. s. of La Belle, Aug. 14, 1929, *H. O'Neill* (US, F). LEE Co.: in pinelands, Fort Myers, Aug. 9, 1916, *J. Standley*, 313 (G (NY, type of *Laciniaria Nashii* Small), US); sand, *Ft. Myers*, Sept. 5, 1928, *G. F. Weber* (F); around ponds, Fort Myers, July–Aug. 1900, *A. S. Hitchcock*, 155 (G, NY, US). COLLIER Co.: Cat Tail Island, Big Cypress, Feb. 26, 1919, *P. P. Sheenan* (NY); pineland near Naples, Aug. 4, 1937, *Miss E. Scull* (F); flatwoods ditch, 9 mis. n. of Naples, Aug. 18, 1945, *L. O. Gaiser, Mrs. H. T. Butts, Miss L. Arnold* (F).

This is a singularly interesting species since it is the only one occurring anywhere east of the Mississippi that has elongate, thickened roots. While west of the Mississippi there are *L. punctata*, with a long ramifying rootstock, and *L. densispicata* Bush, which sometimes sends up aerial shoots as from the nodes of a rhizome, *L. Garberi* gives the only example of a clustered root that is rather fleshy and fingeroid. In the general appearance of its spike, in specific characters of pappus and corolla, as well as its habitat in damp soil, it is related to the *Spicatae* rather than the *Punctatae* series. It is however the only really hirsute member of the series. From members of the *Graminifoliae* series it is separated by the non-pilose corolla-tube. On examination of three sheets of Sept. 1877, *A. P. Garber*, Tampa, Florida (NY, US, P), named *Laciniaria chlorolepis* Small l. c., no sharp distinctions could be found to separate them from *L. Garberi*, while the fleshy root suggested close relationship to it.

SERIES II. PYCNOSTACHYAE. Glabrous to hirsute plants of numerous stiff spikes from large crowned perennial stocks; leaves linear, diminishing gradually upwards; paralleling west of the Mississippi the *Spicatae* series to the east; heads of approximately similar size and shape but with phyllaries acute to acuminate and recurved to merely loosely appressed; corolla-tube non-pilose within.

6. LIATRIS PYCNOSTACHYA Michx. From an enlarged (though globose in young plants) woody rootstock often attaining 1 dm. in width: stems one to many, 6–15 dm. tall, stiff, striate, generally hirsute, sometimes glabrous: leaves numerous, linear, punctate, lower ones 1 dm. long, 4–5 mm. wide, hirsute or glabrous, gradually decreasing in length upwards and passing into bracts subtending the heads, which are 5–12-flowered, cylindrical, ca. 1 cm. long, sessile, crowded in very dense spikes 1.5–3 dm. long, 2–3 cm. in diameter, with a generally hirsute rachis; phyllaries herbaceous or purplish, lanceolate-acuminate or oblong with more or less acute tips, that are markedly squarrose, scarcely reflexed or merely lax and spreading; margin mostly ciliate when herbaceous but frequently merely crisped and sometimes petaloid; corolla phlox-purple, occasionally white, 7–9 mm. long, tube nonpilose or with very few hairs within; achenes 4–7 mm. long; pappus 6–7 mm. long, barbellate.—Michx. Fl. Bor. Amer. ii. 91 (1803); Torr. & Gray, Fl. N. Am. ii. 74 (1841), α and β; Gray, Synop. Fl. i^2. 110 (1884). *L. brachystachya* Nutt. Journ. Acad. Phil. vii. 72 (1834) and Trans. Amer. Phil. Soc. vii. 284 (1841). *L. Bebbiana* Rydb., Brittonia, i. 99 (1931). *Laciniaria Langloisii* Greene Pittonia, v. 58 (1902). *Liatris Langloisii* (Greene) Cory, RHODORA, xxxviii. 407 (1936). *Laciniaria macilenta* Small, Man. S. E. Fl. 1333 (1933). *Liatris pycnostachya* f. *Hubrichti* E. Anderson, Bull. Mo. Bot. Gard. xxv. 122 (1937) (albino form).

From the prairies of Indiana to South Dakota southward to Louisiana, Texas, and Oklahoma.—INDIANA. JASPER CO.: Without stated locality, Aug. 7, 1878, *T. M. Coulter* (G). NEWTON CO.: in prairie, along Penn Rwy., just w. of Goodland, Sept. 5, 1938, *C. C. Deam*, 59098 (O). VIGO CO.: in prairie habitat, along Vandalia Rwy., 4 mis. s. e. of Atherton, Sept. 23, 1917, *C. C. Deam*, 23994 (G). KENTUCKY. Co. undetermined: Barrens of Kentucky, 1835, *C. W. Short* (NY). WISCONSIN. Co. undetermined: Kalbs Farm, near East River, Aug. 5, 1878, *J. H. Schuette* (G, NY). JUNEAU CO.: Camp Douglas, July 16, 1890, *E. A. Mearns* (NY). COLUMBIA CO.: Dells of Wisconsin, July 20, 1886, *C. H. Sylvester* (NY). SAUK CO.: Kilbourn, Aug. 26, 1909, *E. S. Steele*, 33 (G, NY). MILWAUKEE CO.: Bay View, July 31, 1880, *Dr. Hasse* (NY). DANE CO.: Lake Geneva, *Mrs. E. Bayer* (US); Madison, Aug. 30, 1893, *J. R. Churchill* (G). ROCK CO.: Clinton, along the Chicago N. W. Rwy., Sept. 1, 1909, *E. S. Steele*, 109 (G). MINNESOTA. PENNINGTON CO.: 24.5 mis. s. of Thief River Falls, July 18, 1934, *J. B. Moyle*, 1326 (NY). HUBBARD CO.: Park Rapids, July 15, 1940, *H. A. Gleason*, 9443 (NY). POPE CO.: Glenwood, Aug. 1891, *B. C. Taylor*, 3641 (G, NY); Montevideo, Aug. 6, 1899, *L. Moyer* (NY); Montevideo, Aug. 9, 1906, *L. Moyer* (NY). HENNEPIN CO.: St. Anthony Park, Minneapolis, July 18, 1888,

J. H. Schuette (G, NY); Fort Snelling, Aug. 19, 1889, *E. A. Mearns* (G); wet prairie, Fort Snelling, July 31, 1888, *E. A. Mearns* (G); Fort Snelling, Aug. 28, 1881, *E. A. Mearns* (NY); Fort Snelling Reservation, Aug. 7, 1909, *C. O. Rosendahl*, 2344 (G). GOODHUE Co.: Zumbrota, Aug. 1892, *C. A. Ballard* (NY). MURRAY Co.: Lake Shetek, July 1922, *F. P. Metcalf*, 1897 (G, NY); without stated locality, July 1900, *J. M. Holzinger* (NY). ILLINOIS. Without stated locality: *S. B. Mead* (G, NY), *M. S. Bebb* (US). Co. undetermined: prairies, 1837, *C. W. Short* (G); prairies, 1849, *G. Vasey* (G). MCHENRY Co.: Ringwood, *G. Vasey*, 2 (G). WINNEBAGO Co.: Fountaindale, *M. S. Bebb* (G (NY type of *L. Bebbiana*) US). COOK Co.: moist prairie, e. border of Riverside, Aug. 24, 1909, *E. S. Steele*, 142 (G). KANE Co.: Aurora, Sept. 1884, *T. E. Boyce*, 1180 (G). ROCK ISLAND Co.: moist prairies, near Barstow, Aug. 1889, *F. E. McDonald* (G). KNOX Co.: damp prairie, Yates City, Aug. 1912, *F. E. McDonald* (G). MCLEAN Co.: prairie, Bloomington, Aug. 1886, *B. L. Robinson* (G). HANCOCK Co.: Augusta, 1842, *S. B. Mead* (G); *S. B. Mead*, Herb. H. A. Gleason, 1208 (G). CHAMPAIGN Co.: Champaign, July 23, 1898, *H. A. Gleason*, 292 (G); Big Four Rwy. toward Maryville, vicinity of Urbana, Aug. 11, 1910, *E. S. Steele* (US). CASS Co.: Beardstown, Aug. 1842, *C. A. Geyer* (G). ADAMS Co.: prairie, w. of Camp Point, July 18, 1941, *R. A. Evers, G. N. Jones & F. F. Jones*, 569 (G). CALHOUN Co.: prairie, Sept. 13, 1914, *R. Ridgway* 89 (G). MADISON Co.: wet prairies, Aug. 5, 1878, *H. Eggert* (G); Carbon, Aug. 5, 1878, *H. Eggert* (NY, US). RICHLAND Co.: near Olney, Sept. 6, 1914, *R. Ridgway* (G). WASHINGTON Co.: Irvington, Aug. 13, 1873, *G. H. French* (NY, US). IOWA. Without stated locality: *Chapman* (NY). EMMET Co.: Armstrong, Aug. 15, 1897, *R. I. Cratty* (G). DICKINSON Co.: low prairie s. w. of Miller's Bay, w. of Okoboyi Lake, Aug. 11, 1916, *B. Shimek* (G, US). FAYETTE Co.: Fayette, Aug. 1894, *B. Fink* (G). HARDIN Co.: vicinity of Iowa Falls, Aug. 1928, *M. E. Peck* (G). HAMILTON Co.: 2 mis. n. w. of Webster, Aug. 29, 1933, *Miss A. Hayden*, 412 (NY). MARSHALL Co.: La Moille to Marshalltown, Aug. 21, 1927, *C. C. Lounsbury* (O). STORY Co.: Ames, Aug. 8, 1896, *L. H. Pammel & C. R. Ball*, 40 (G, NY, US); Ames, Aug. 10, 1872, *J. C. Arthur* (NY); Ames, Aug. 4, 1907, *R. S. Jeffs* (O). JOHNSON Co.: Iowa City, Aug. 25, 1882, *B. Shimek* (US); Lake Macbride, July 1938, *J. L. Lofek* (NY). POWESHIEK Co.: Grinnell, *M. E. Jones* (NY). DALLAS Co.: without stated locality, Aug. 8, 1867, *J. A. Allen* (G). HARRISON Co.: Woodbine, 1875, *L. H. Horpradt*, 60 (US). DECATUR Co.: prairies, Aug. 24, 1897, *T. J. Fitzpatrick & M. F. L. Fitzpatrick*, 13548 (G). MISSOURI. Co. undetermined: Wolf Creek to Independence City, July 20, 1849, *A. Fendler* (G); Ozark region, St. Louis & San Francisco Rwy., July 25, 1896, *N. M. Glatfelter*

(US). CLARK Co.: Medill, Aug. 24, 1910, *B. F. Bush*, 9169 (NY). ADAIR Co.: Kirksville, Aug. 6, 1887, *C. S. Sheldon* (NY). ROLLS Co.: Hannibal, Sept. 8, 1916, *J. Davis*, 251 (G). JACKSON Co.: prairies, Martin City, July 25, 1902, *K. K. Mackenzie*, 46 (NY); Buckner, Aug. 15, 1886, *B. F. Bush* (US). ST. LOUIS Co.: St. Louis, *Drummond* (G); St. Louis, Aug. 1845, *G. Engelmann* (G); St. Louis, July 22, 1910, *E. E. Sherff* (G); wet prairie hillsides, Aug. 5, 1878, *H. Eggert* (US). CASS Co.: w. Belton, Aug. 4, 1902, *K. K. Mackenzie*, 96 (NY). HENRY Co.: Clinton, July 31, 1911, *W. L. McAtee*, 3035 (G, US). VERNON Co.: near Horton, Aug. 1, 1919, *W. L. McAtee*, 3043 (US). POLK Co.: 5 mis. n. of Bolivar, Aug. 1, 1937, *J. A. Steyermark*, 24046 (NY). WEBSTER Co.: without stated locality, Aug. 1883, *Miss Hosmer* (G). JASPER Co.: dry prairies, Webb City, July 26, 1908, *E. J. Palmer*, 1348 (US); high prairies, Sarcoxie, July 15, 1914, *E. J. Palmer*, 6262 (US); Sarcoxie, Aug. 14, 1897, *C. H. Demetrio*, 45 (NY); Carthage, Sept. 4, 1913, *F. W. Pennell*, 5369 (NY). OREGON Co.: 3 mis. n. of Kosh Konong, Aug. 9, 1934, *J. A. Steyermark*, 14383 (US). ARKANSAS. Without stated locality: *Leavenworth* (G), 1882, *F. L. Harvey* (US). Co. undetermined: northwest Ark., Aug. *F. L. Harvey* 12 (G). BENTON Co.: 1899, *E. N. Plank* (NY). WASHINGTON Co.: without stated locality, 1895, *J. W. Blankinship*, 17 (G). FRANKLIN Co.: moist meadow, Charleston, July 17, 1935, *F. J. Scully*, 372 (G). PRAIRIE Co.: Hazen, July 25, 1937, *D. Demaree*, 15460 (O); waste areas in Grand Prairie, Hazen, June 29, 1941, *D. Demaree*, 22293 (G). LONOKE Co.: Carlisle, July 31, 1938, *D. Demaree*, 18010 (O). GARLAND Co.: open dry woods, Glenwood Rd., Hot Springs, July 1, 1938, *F. J. Scully*, 1072 (US). ARKANSAS Co.: Stuttgart, July 18, 1937, *D. Demaree*, 15424 (O). CLARK Co.: low pine woods, Gurdon, Oct. 23, 1893, *C. Mohr* (NY, US). HOWARD Co.: Baker Springs, Oct. 2, 1909, *J. H. Kellogg* (US). LOUISIANA. Without stated locality: *Leavenworth* (NY), *Hale* (G, NY). NATCHITOCHES Co.: dry sandy woods, Oct. 3, 1915, *E. J. Palmer*, 8813 (US). RAPIDES Co.: Alexandria, *Hale* (NY, US). SAINT TAMMANY Co.: Covington, Sept. 30, 1911, *N. F. Peterson* (NY); Covington, April 5, 1912, *Bell & Peterson* (NY); 1 mi. n. of Abita Spring, Aug. 13, 1912, *F. W. Pennell*, 4140 (NY); 1 mi. n. of Abita Spring, Aug. 17, 1912, *F. W. Pennell*, 4252 (NY). ACADIA Co.: wet prairies, Oct. 1, 1895, *A. B. Langlois* (ND, type of *L. Langloisii* Cory). JEFFERSON DAVIS Co.: low prairies, Welsh, Sept. 10, 1915, *E. J. Palmer*, 8483 (US). CALCASIEU Co.: Lake Charles, Aug. 7, 1897, *S. M. Tracy*, 3447 (NY); moist pineland n. w. of West Lake, Sept. 23, 1913, *F. W. Pennell*, 5615 (NY). SOUTH DAKOTA. ROBERTS Co.: White Rock, 1903, *Mrs. H. D. Powell* (G). NEBRASKA. CASS Co.: low meadows & prairies, Weeping Water, *T. A. Williams* (US); Wabash, Aug.

1, 1889, *T. A. Williams*, 196 (US); Nehawka, *G. D. Swezey*, 189 (NY). Buffalo Co.: prairies, Aug. 1922, *W. E. B.*, 13071 (O). KANSAS. Riley Co.: Manhattan, Aug. 9, 1892, *J. B. Norton* (US, ND). Miami Co.: without stated locality, July 23, 1884, *J. H. Oyster* (NY). Cherokee Co.: without stated locality 1898, *L. V. Harvey* (US). Montgomery Co.: Caney, Aug. 31, 1895, *J. W. Blankinship* (G). OKLAHOMA. Co. undetermined: Choctaw Agency[1], July 19, 1853, *Whipple's Exped., J. M. Bigelow* (NY, US); Red River, *Dr. Pitcher* (NY). Ottawa Co.: in dry pasture, Ottawa, Aug. 29, 1913, *G. W. Stevens*, 2502 (G, NY). Osage Co.: in low places in prairies, Copan, Aug. 18, 1913, *G. W. Stevens*, 2143 (G, US, T, O). Tulsa Co.: near Dawson, July 8, 1928, *J. J. Meyer*, 112 (O); e. of Dawson, July 8, 1928, *Mr. Meyer* (O); s. of Tulsa, July 22, 1937, *P. V. Beck*, 169 (O); Tulsa, July 17, 1928, *Miss E. R. Force* (O). Noble Co.: near Perry, *Bayliff* (O). Cherokee Co.: wet prairies, Aug. 19, 1895, *J. W. Blankinship* (G, US). Creek Co.: Sapulpa, July 27, 1894, *B. F. Bush* 218 (G, US). Muskogee Co.: moist prairies, 3 mis. e. of Muskogee, July 18, 1926, *E. L. Little*, 190 (O); Lot 1, July 23, 1927, *E. L. Little*, 1992 (O); Lot 3, Aug. 28, 1927, *E. L. Little*, 2453 (O). LeFlore Co.: Page, Sept. 8, 1913, *G. W. Stevens*, 2691½ (G); Page, July 11, 1914, *O. W. Blakeley*, 1497 (G); Talihina, Aug. 4, 1933, *U. T. Waterfall* (NY). Latimer Co.: Laura, June 16, 1930, *O. M. Clark* (O). Pittsburgh Co.: McAlester, July 8, 1894, *C. S. Newhall*, 2 (G). Pontotoc Co.: near Stonewall, July 10, 1891, *C. S. Sheldon*, 126 (US). McCurtain Co.: open sandy ground, Idabel, July 22, 1915, *E. J. Palmer*, 8372 (US). Stephens Co.: 8 mis. s. of Dixie, July 26, 1905, *A. H. Van Fleet* (O). Choctaw Co.: dry open ground, Ft. Towson, July 16, 1915, *E. J. Palmer*, 8304 (US); [2]Ft. Towson, *Leavenworth* (G, NY). Bryan Co.: vic. of Durant, 1931, *W. L. Blain*, 222 (US). TEXAS. Without stated locality: 1843, *Lindheimer*, 74 (G); *C. Wright* (G). Morris Co.: Naples, June 27, 1935, *H. B. Parks & V. L. Cory*, 14426 (T). Smith Co.: Swan, June 10, 1902, *J. Reverchon*, 3305 (US). Houston Co.: sandy open bogs, Grapeland, Sept. 16, 1915, *E. J. Palmer*, 14406 (US); open sandy bog, Grapeland, Sept. 22, 1917, *E. J. Palmer* 12843 (US). Trinity Co.: 5 mis. s. w. of Trinity, Sept. 29, 1934, *V. L. Cory*, 10477 (G, T). Newton Co.: without stated locality, July 23, 1939, *B. C. Tharp* (G); 21 mis. n. of Deweyville, Oct. 4, 1934, *V. L. Cory*, 10963 (G). Tyler Co.: without

[1] In J. M. Bigelow—Report on Lieut. Whipple's Expedition, 1857, p. 96, Sec. 4, no mention is made of this species being collected. The maps and notes of country covered refer to Oklahoma.

[2] According to Barnhart, Journ. N. Y. Bot. Gard. xxii. 131 (July, 1921), Dr. Leavenworth, then a surgeon in the U. S. Army, was first stationed at Fort Towson (which is in Choctaw Co.), and it is probable that this collection was made in that vicinity.

stated locality, July 22, 1939, *B. C. Tharp* (G). WALKER Co.: on blackland prairie, Huntsville, July 9–12, 1909, *R. Dixon*, 402 (G, NY); without stated locality, 1920, *S. R. Warren*, 80 (US). HARDIN Co.: 2.6 mis. e. of Camp Jackson, Sept. 13, 1936, *V. L. Cory*, 19797 (G); (an albino) 2.6 mis. e. of Camp Jackson, Sept. 13, 1936, *V. L. Cory*, 19798 (G); without stated locality, *B. C. Tharp* (NY); Silsbee, Sept. 1926, *F. W. Pennell*, 5596 (NY). HARRIS Co.: Cypress, Aug. 1877, *S. Ball, ex Herb. Reverchon*, 752 (G); La Porte, Aug. 6, 1939, *H. R. Reed*, 314 (G); Bammel's Ranch, July 18, 1925, *H. Ness* (T); Pierce, July 19, 1901, *S. M. Tracy*, 7331 (NY). AUSTIN Co.: San Felipe, Aug. 1832, *T. Drummond*, 142 (G); ca. 7 mis. n. e. of Bellville, July 22, 1939, *B. C. Tharp* (G); Austin, Aug. 17, 1922, *B. C. Tharp*, 1393 (US). JEFFERSON Co.: Fannett, Aug. 28, 1932, *B. C. Tharp* (G). GALVESTON Co.: 13 mis. n. w. of Galveston, Aug. 4, 1939, *H. R. Reed*, 29 (G). FORT BEND Co.: Rosenburg to Wallis, July 11, 1929, *B. C. Tharp*, 7497 (G); Sugarland, Aug. 5, 1933, *O. Degener*, 5174 (NY). BRAZORIA Co.: Angleton, Sept. 14, 1933, *B. C. Tharp* (G). WHARTON Co.: between Ganado & Wharton, Sept. 19, 1921, *R. S. Ferris & C. D. Duncan*, 3253 (NY). MATAGORDA Co.: Palacios, July 2, 1939, *B. C. Tharp* (NY); without stated locality, July 2, 1939, *B. C. Tharp* (G). JACKSON Co.: near Edna, July 18, 1930, *S. E. Wolff*, 2421 (US); eastern part of county, July 22, 1939, *B. C. Tharp* (G).

André Michaux (Fl. Bor.-Amer. ii. 91 (1803)) described *L. pycnostachya* from "the Illinois meadows" together with *L. macrostachya* from Virginia and Carolina. Though there is no reference made to the collection of *Liatris* or *Serratula* in his journal (Proc. Amer. Phil. Soc. xxiv. no. 129, pp. 1–145 (1889)), he botanized along the Mississippi to the vicinity of Kaskaskia, a point 94 miles south of St. Louis. In the map of F. A. Michaux, (Travels to the westward of the Alleghany mountains, J. Mawman, 350 pp. (1805)), that region east of the Mississippi was called Illinois. The descriptions of the two species are very similar, the most distinctive difference being the nature of the phyllaries, squarrose at the tips in the former and appressed in the latter. A second difference is in pubescence, stem hirsute and leaves pubescent in *pycnostachya* and cilia basally on the shining leaves of *macrostachya*. Much of the puzzle in limiting this species has been bound up with the varying expressions of these two characters. Michaux's *L. macrostachya* seems none other than Linnaeus' *L. spicata*.

Nuttall (Jour. Acad. Phil. vii. 72 (1834)) described a new

species, *L. brachystachya*, for a very glabrous plant collected by Dr. Pitcher in Arkansas. He, however, made it synonymous with *L. pycnostachya* Michx. in a later publication (Trans. Amer. Phil. Soc. n. s. vii. 284 (1841)) and this procedure was also followed by Gray l. c. for the glabrous variety β, that had been adopted by Torr. & Gray l. c. from the description of Nuttall's species. Delimitation of hirsute and glabrous individuals as varieties seems useless because they occur without any special geographical range and various intermediates are so abundant.

Examination of a photograph of Michaux's type specimen (Paris), shows the phyllaries of the expanded heads as not markedly squarrose and neither sharply acute nor long-acuminate but rather oblong or lanceolate-acuminate and slightly reflexed ("apice reflexis" as given in Michaux's handwriting on the label of the specimen). The rachis and leaves clearly show a hairy condition.

Comparison of many specimens from the Mississippi basin shows a variation in phyllaries from long-acuminate, quite strongly recurved, to oblong with acute tips and less recurved, and to merely spreading. Also, although the stem is generally hirsute there is a range from plants with glabrous stems and almost glabrous recurved phyllaries without ciliate margins, through plants with hirsute stems and only scattered hairs along the midveins beneath and scant cilia on the margins of the outer phyllaries while the remainder have a crisped margin, to those with more generally hirsute leaves and phyllaries with ciliate margin to completely hirsute phyllaries.

Rydberg (Brittonia i. 99 (1931)) described *L. Bebbiana* from Illinois, stating it was "related to *L. pycnostachya* but the outer bracts are ovate and merely acute, not lanceolate and long acuminate". A detailed study of the type specimen (*M. S. Bebb*, Fountaindale, Winnebago Co., Ill., (NY)), has failed to disclose how this or any other fundamental character can separate it from *L. pycnostachya* Michx.

The most extreme cases of only slightly recurving non-acuminate phyllaries, combined with a glabrous condition, approach *L. spicata* (as *F. L. Harvey*, no. 12, from N. W. Arkansas (G), or of 1849, *G. Vasey* no. 2, Ringwood, McHenry Co., Ill. (G)). Or again, as referred to under *L. lancifolia* (see no. 2), in the more

western states, intergrades between the two of that region are suggested by ovate, ciliate-margined or but slightly crisped phyllaries. An occasional specimen with very broad leaves, as in *L. lancifolia*, but with the more *pycnostachya*-like inflorescence, as of July, 1891, *Hapeman*, from Platte Valley, at Fort Kearney, Neb. (US), gives further evidence of this mixture.

Greene (Pittonia v. 58 (1902)) described *L. Langloisii* from Louisiana, as allied to *L. pycnostachya* but well marked by its pale herbage and colorless involucral bracts, "wanting the purple tips of the kindred species". Examination of the type specimen (Oct. 1, 1895, *A. B. Lamglois*, from wet prairies, Acadia Co., Louisiana (ND)), showed that at the time of collection the spike had passed the blooming stage and was in seed, at which time (as noted in the introduction) the phyllaries of *Spicatae* and *Pycnostachyae*, if they have been colorful, usually become green. The strongly hirsute condition is marked, giving a glaucescent green color. But specimens from the more southern end of the range are frequently very hirsute without any correlation with lack of color of the phyllaries or smaller size of the achene. Thus the various combinations of herbaceous or purple-petaloid, glabrous or hirsute phyllaries, make it as difficult to draw sharp distinctions between *L. pycnostachya* and *L. Langloisii*, as acuminate or ovate, recurving or spreading phyllaries make it impossible to decide between *L. pycnostachya* and *L. Bebbiana*.

Specimens from Louisiana, as one showing markedly recurved phyllaries (Sept. 10, 1915, *E. J. Palmer*, no. 8483, from low prairies, Welsh, Jefferson Davis Co., (US)) and another showing them less so (Oct. 3, 1915, *E. J. Palmer*, no. 8813, dry sandy wood, Natchitoches (US)) give further support to the explanation offered for puzzling hirsute forms allied to *L. spicata* (see no. 1), as possible intermediates between these two species at the southern end of their ranges. The specimen of Aug. 20, 1903, *S. M. Tracy*, no. 8533, from Mendenhall, Simpson Co., Miss. (G, T) is still the only evidence I have seen of *pycnostachya*-like plants from Mississippi and since specimens from Louisiana, as that of A. B. Langlois and those of Bro. Arsène, show such varying degrees of hirsuteness combined with spreading of phyllaries, I prefer to treat them together as intermediates between *spicata* and *pycnostachya*.

As Gray (Synop. Fl. i². 111 (1884)) stated of *L. pycnostachya:* "Apparently this hybridizes with *L. spicata:* at least specimens occur which are intermediate between the two species." This is probably as true for the conditions on the frontiers of their occurrence (i. e. in Louisiana and Nebraska) as in the center of their overlapping ranges (specimen of Aug. 24, 1897, *T. J. & M. F. L. Fitzpatrick*, no. 13548, from prairies of Decatur Co., Iowa (G)). The number of intermediates is great and their variety so wide as to make impossible a type description of such hybrid populations. Since these two species are the most favored of the genus in perennial borders, many garden specimens showing different kinds of intermediacy are met with under a variety of horticultural names, not included here.

Records of single collections of each of two other interspecific hybrids follow.

× Liatris Ridgwayi Standl. (*L. pycnostachya* × *squarrosa*). Upper portion of plant only seen: stem slightly pilose; leaves linear, pubescent on under surface, gradually decreasing in length upwards; spike 19 cm. long and 3 cm. wide; heads ca. 18–flowered, sessile, somewhat crowded, subtended by foliar bracts, longer than or about equalling the length of the heads; outer phyllaries lanceolate-oblong, acuminate, almost entirely green or purple-tipped, pilose, with ciliate margins and somewhat squarrose apices; inner phyllaries oblong, appressed, acute or acuminate, almost glabrous, purple-tipped and recurved; corolla purple, 10 mm. long, inner surface of lobes hairy; achenes 3–5 mm. long; pappus 9 mm. long and short-plumose.—Rhodora, xxxi. 37 (1929).—ILLINOIS. Richland Co.: east of Bethel Church, Aug. 26, 1928, *R. Ridgway*, 3265 (Field Museum no. 579880, type, not seen; isotypes, G, US).

This rare plant was found growing with *L. pycnostachya* and *L. squarrosa* and, though it resembles the former more closely in general appearance, it is intermediate in other characters, as in number, distribution and size of heads and in the pappus. In the outer green phyllaries, the long foliose bracts subtending the heads and the hairy corolla lobes, it resembles *L. squarrosa.*

× Liatris **Frostii,** hybr. nov. (*L. aspera* × *pycnostachya*). Caulis unus 10.3 dm. altus superne pilis albis crispatis dense hirsutus denseque foliosus solum visus; foliis basalibus lanceolatis 1.5 cm. longis, 6 mm. latis sessilibus paginis ambobus hirsutis, medianis gradatim minoribus minusque hirsutis, superioribus

longitudine capitula aequantibus haud hirsutis; capitulis multis inter se distantibus 13-floris sessilibus leviter campanulatis ca. 13 mm. longis; phyllariis obtusis petaloideis marginibus purpurascentibus, exterioribus brevibus oblongis marginibus crispatis, interioribus apice leviter dilatatis plus petaloideis ca. 9 mm. longis; corollis 9 mm. longis intus pilosis; achaeniis 4 mm. longis, pappo 7 mm. longo vix plumoso nisi manifeste barbellato. —MINNESOTA: KANDIYOHI Co.: Spicer, Aug., 1892, *W. D. Frost* (G: TYPE).

This single specimen, like which no others have been seen and about the collection of which there is no exact information, strongly suggests another case of hybridization, and between two species for which there had previously been no such report. It resembles *L. pycnostachya*, a species occurring throughout that part of Minnesota, specimens of which from the adjoining county of Polk have been seen, in the more general appearance of the stem with many narrow leaves, and a fairly dense spike of numerous elongate heads. However, in the size of the heads and the obtuse tips and petaloid, crisped margins of all the phyllaries, it resembles *L. aspera*. From the township of Whitefield, lying about 8 miles south of Willmar and about 20 miles south and west of Spicer, two specimens have been seen of the same collector, W. D. Frost, no. 4893, collected in the same month, one of which, though not typical, is near *L. aspera* (US884659) and the other, *L. ligulistylis* (US201918), two species abounding and also hybridizing freely in that district (see no. 20). On examination of the corolla-tube of this particular specimen, × *L. Frostii*, it was found to be pilose within as in *L. aspera* thus pointing more toward that parentage than to *L. ligulistylis*.

SERIES III. GRAMINIFOLIAE. Plants with generally more open inflorescences than *Spicatae* and *Pycnostachyae*, varying from stiff-spicate to branched-paniculate and slender-racemose; leaves mostly ciliate along the petioles or with scattered hairs on mid-veins, if not entirely hirsute; heads 3–20-flowered, .7–1.5 cm. long, turbinate when flowers are open; phyllaries obtuse, with fine ciliolate margins mostly appressed when in bud but loosely spreading in mature heads; corolla-tube pilose within; achene 3–5 mm. long.

From the coastal plain of New Jersey to Florida and westward through and along the Appalachian ridge to the Gulf of Mexico.

a. All leaves linear to linear-lanceolate; phyllaries spreading in mature turbinate heads . . . . b.
b. Heads 5–15-flowered . . . . c.
c. Phyllaries without prominent mid-vein and with ciliolate margin; inflorescence varying from slender few-headed racemes to loose spikes or panicles . . . . d.
d. Pappus about as long as the corolla-tube . . . . . 7. *L. graminifolia.*
d. Pappus only half as long as the corolla; found only in the mountains of several adjacent counties in western N. Carolina . . . . . 8. *L. Helleri.*
c. Phyllaries with prominent midvein or keel and with entire margin; inflorescence generally loose, spicate to paniculate . . . . . 11. *L. regimontis.*
b. Heads 3–5-flowered; phyllaries without keel and quite ciliate; pedicels slender and often at right angles to the stem; heads short-turbinate when flowers are open . . . . 10. *L. gracilis.*
a. Lower leaves more broadly lanceolate, upper ones linear-lanceolate; heads 10–20-flowered; inflorescence more stiffly spicate; phyllaries without keel, obtuse, oblong to orbicular and appressed when in bud, with narrowly scarious or ciliolate margin . . . . . 9. *L. turgida.*

7. LIATRIS GRAMINIFOLIA (Walt.) Willd. Corm globose, up to 3 cm. in diameter; stems single or few, sometimes striate, 3–7 dm. high, glabrous or with long scattered hairs or hirsute; basal leaves 10–15 cm. long, narrowly linear (2 mm. wide) or linear-lanceolate (5–10 mm. wide), with ciliate margins or with long hairs along the winged petioles and sometimes scattered over the lower surface; upper leaves reduced in length and width: inflorescence either a long slender spike, or a fairly dense raceme that frequently becomes paniculate, or an open short raceme of a few scattered heads: heads sessile or pedicellate, of 5–15 flowers, 10–15 mm. high, 6–12 mm. wide and somewhat turbinate in shape at the time of flowering; phyllaries thin, glabrous or hirsute, loose, not overlapping much laterally, narrowly linear to ovate-lanceolate, 1–4 mm. wide, obtuse, scarious and very finely ciliolate on the margin; corolla 6–8 mm. long, purple; pappus 5–6 mm. long, barbellate; achene 3–4 mm. long.—Sp. Pl. iii. 1636 (1803). *Anonymos graminifolia* Walt. Fl. Car. 197 (1788).

From New Jersey and southern Pennsylvania southward to Florida and Alabama.

KEY TO VARIETIES

a. Inflorescence somewhat spicate, though often paniculate, and of quite numerous heads; phyllaries narrowly linear, 1–3 mm. wide . . . . b.
b. Leaves narrowly linear; stem and leaves with scattered hairs; heads small, with narrowly linear phyllaries ca. 1 mm. wide; from the coastal plain region of Virginia and the Carolinas . . . . . var. *typica.*
b. Basal leaves broader, linear-lanceolate; stem and leaves mostly glabrous, but with long hairs along the winged petioles; heads larger; of more general distribution in the northeastern range of the species . . . . . var. *dubia.*

b. Stem and pedicels densely hirsute; leaves linear-lanceolate; of northern range ..... var. *lasia*.

a. Inflorescence slender, somewhat virgate, with few scattered heads; phyllaries a little broader, 3–4 mm. wide and frequently rounded at the tip . . . c.

c. Shorter plants of few leaves, the basal linear-lanceolate, much longer than the others; from mountains in Virginia, North and South Carolina ..... var. *Smallii*.

c. Taller plants with more numerous linear leaves; from Georgia, Alabama and Florida ..... var. *elegantula*.

Var. **typica.** Stems tall, slender, with long scattered hairs: leaves numerous, generally with abundant long hairs; basal ones narrowly linear, 10–12 cm. long and 2–4 mm. wide, with ciliate margins; upper ones reduced in length, and in width to 1 mm.: inflorescence usually a long, slender, dense spike of 2 cm. width when flowers are open, sometimes becoming paniculate: heads 5–9-flowered, mostly sessile and erect, ca. 1 cm. high, 5–6 mm. wide when flowers are open; phyllaries narrowly linear, ca. 1 mm. wide; corolla-tube 6–7 mm. long; pappus 4–5 mm. long; achene ca. 3 mm. long.—*Anonymos graminifolia* Walt. Fl. Car. 197 (1788). LIATRIS GRAMINIFOLIA Willd. Spec. Pl. iii. 1636 (1803); Ell. Sk. ii. 274 (1824).

New Jersey to Alabama, chiefly on the coastal plain.—NEW JERSEY. OCEAN Co.: in sandy field, Forked River, Aug. 31, 1937, *H. N. Moldenke*, 10172 (NY). BURLINGTON Co.: Atsion, Aug. 1877, *T. C. Martindale* (US). CAMDEN Co.: Atco, Sept. 15, 1904, *T. W. Edmondson*, 1201 (G). ATLANTIC Co.: Weymouth, Sept. 12, 1923, *E. P. Killip*, 12395 (US). CAPE MAY Co.: on sand dunes, Five Mile Beach, Oct. 2, 1889, *A. MacElwee* 1413 (NY); in sandy Rwy. bed, Wildwood, Aug. 6, 1928, *A. Moldenke*, 4084 (NY); without stated locality, Sept. 20, 1894, *C. Mohr* (US). MARYLAND. HARFORD Co.: without stated locality, Aug. 10, 1873, *J. W. Eckfeldt* (P); along Bush R., n. of Bush R. Sta., Sept. 10, 1902, *G. H. Shull* (G). BALTIMORE Co.: near Baltimore, 1873, *D. Foreman* (US); Oakwood, near Baltimore, Sept. 6, 1896, *A. Fredholm*, 2224 (NY, US). ANNE ARUNDEL Co.: dry soil, right of road, from Muirkirk to Contee, Sept. 5, 1910, *A. H. Moore*, 4832 (G). PRINCE GEORGES Co.: low pasture land, vicinity of Lanham, June 28, 1910, *W. R. Maxon*, 4605 (US); dry field, Carter's Lane, Sept. 29, 1914, *E. S. Steele* (US). DELAWARE. SUSSEX Co.: s. of Robbins, Sept. 5, 1925, *F. W. Pennell*, 12865 (P); moist swale, ¼ mi. e. of Ellendale, Sept. 23, 1938, *R. R. Tatnall*, 4053 (G). DISTRICT OF COLUMBIA AND VICINITY. Terra Cotta Swamp, Aug. 1895, *D. L. Topping* (US); vicinity of Washington, Oct. 1, 1876, *L. F. Ward* (US). VIRGINIA. ARLINGTON Co.: 1 mi. e. of Rwy., Barcroft Station, Oct. 3, 1915, *E. S. Steele* (US); edge of sandy oak woods, on Washington Blvd., at Glebe Road, Sept. 28, 1940, *F. J.*

Hermann (NY); Rwy., Cowdons, Sept. 22, 1912, *E. S. Steele*, 643156 (US). James City Co.: on dry sandy red soil by roadside, 2 mis. w. of Williamsburg, Sept. 27, 1921, *E. J. Grimes*, 4625 (NY); dry barren soil, 2 mis. s. of Williamsburg, Sept. 23, 1921, *E. J. Grimes*, 4427 (NY); along C. & O. Rwy. 1 mi. w. of Lightfoot, Sept. 26, 1921, *E. J. Grimes*, 4496 (NY); dry sandy soil, along C. & O. Rwy. e. of Lightfoot, July 23, 1921, *E. J. Grimes* 4096 (NY). Prince George Co.: 1–3 mis. w. of New Bohemia, Sept. 24, 1927, *E. T. Wherry & F. W. Pennell*, 14415 (P). Chesterfield Co.: dryish swale, n. w. of Colonial Heights, Sept. 16, 1938, *M. L. Fernald & B. Long*, 9452 (G). Sussex Co.: moist pinelands, just s. e. of Waverly, Sept. 10, 1937, *M. L. Fernald & B. Long*, 7661 (G, US); damp sandy pine & oak woods, s. of Stony Creek, Sept. 21, 1939, *M. L. Fernald & B. Long* 11455 (G). Dinwiddie Co.: ca. 1 mi. n. e. of Burgess, Sept. 13, 1937, *M. L. Fernald & B. Long* 7662 (G); dry pine woods, n. w. of Carson, Sept. 14, 1937, *M. L. Fernald & B. Long* 7663 (G). Princess Anne Co.: along trailsides in pine-oak-hickory forest, Cape Henry, Sept. 3, 1940, *F. E. Egler*, 40–348 (NY); dry oak woods, The Desert, Cape Henry, Sept. 23, 1933, *M. L. Fernald & L. Griscom*, 2907 (G). Nansemond Co.: dry sandy woods & adjacent clearings, Kilby, Sept. 11, 1935, *M. L. Fernald & B. Long* 5078 (G); Suffolk, Sept. 17, 1907, *E. B. Bartram & B. Long*, (US); Kilby, Sept. 11, 1935, *M. L. Fernald, B. Long & J. M. Fogg*, 5145 (G). Southampton Co.: clearing in pine & oak woods, w. of Branchville, Sept. 20, 1938, *M. L. Fernald & B. Long*, 9454 (G). Greensville Co.: mossy pineland e. of Slagle's Pond, n. of Emporia, Sept. 20, 1938, *M. L. Fernald & B. Long*, 9457 (G). NORTH CAROLINA. Without stated locality: *M. A. Curtis* (G). Co. undetermined: eastern North Carolina, Sept. 6, 1908, *W. W. Eggleston*, 4052 (G, NY). Nash Co.: pineland, at Middlesex, Oct. 9, 1938, *R. K. Godfrey & T. Kerr*, 6627 (G); sandy soil, Rocky Mt., Oct. 17, 1912, *F. W. Pennell* (P). Durham Co.: Duke Forest, Sept. 16, 1932, *H. L. Blomquist*, 28 (US); low open dry ground, Old Oxford Rd., Sept. 24, 1938, *H. L. Blomquist*, 10519 (F). Forsyth Co.: Bronton suburbs, Winston Salem, Oct. 30, 1921, *P. O. Schallert* (G). Martin Co.: swale at Williamston, Oct. 13, 1938, *R. K. Godfrey*, 7024 (G). Wake Co.: 4 mis. n. of Raleigh, Oct. 10, 1938, *R. K. Godfrey*, 6688 (G). Chatham Co.: pine woodland, at Siler City, Oct. 12, 1938, *R. K. Godfrey* 6977 (G); along Pittsboro Road, near town, Sept. 29, 1909, *W. C. Coker* (NY). Harnett Co.: pineland near Lilington, Aug. 5, 1938, *R. K. Godfrey* 5673 (G). Lee Co.: open pine woodland, at Sanford, Oct. 12, 1938, *R. K. Godfrey*, 6929 (G). Pamlico Co.: pinelands at Grantsboro, Oct. 11, 1938, *R. K. Godfrey & R. N. White*, 6825 (G). Craven Co.: Newbern, Oct. 10, 1898, *T. H. Kearney*, 2231 (US). Onslow Co.: in dry sandy land, 10

mis. s. of Jacksonville, Nov. 4, 1929, *H. N. Moldenke*, 116a (NY). NEW HANOVER Co.: sandy pineland, Wilmington, Oct. 15, 1912, *F. W. Pennell*, 4907 (US, P); Wilmington, Sept. 20, 1888, *G. McCarthy* (US); vicinity of Wilmington, Nov. 1922, *Mrs. M. H. Cummings* (US). SOUTH CAROLINA. Co. undetermined: dry pineland, Santee Canal, Oct., *H. W. Ravenel* (G). JASPER Co.: Ridgeland, Nov. 13, 1893, *C. Mohr* (US). BEAUFORT Co.: without stated locality, 1882, *Dr. Mellichamp* (US). GEORGIA. Co. undetermined: dry rocky hillside, Oct. 8, 1893, *C. Mohr* (US). ALABAMA. MOBILE Co.: Spring Hill, Sept. 28, 1878, *C. Mohr* (US).

Var. DUBIA (Barton) Gray. Generally the most robust-looking of all the varieties: stem striate and glabrous with scattered hairs: basal leaves linear-lanceolate, 6–10 cm. long, 5–7 mm. wide, with hairs along the winged petioles and sometimes scattered over the lower surface; upper ones reduced in length: heads erect, usually sessile or on short pedicels in a fairly dense raceme, but frequently becoming paniculate, 10–15-flowered and thus larger than in other varieties, 12–15 mm. high and 10–12 mm. thick at the time of flowering; phyllaries linear, ca. 2 mm. wide, obtuse and ciliolate on the margin; corolla purple (rarely white), 6–8 mm. long; pappus ca. 5 mm.; achene 4 mm. long.—*Liatris graminifolia* var. *dubia* Gray, Man. ed. 1. 191 (1848), ed. 2, 185 (1856). *Liatris dubia* Barton, Mat. Med. ii. 223, t. 49 (1818); Gray, Synop. Fl. i^2. 111 (1884), in part. *Serratula spicata* L. Sp. Pl. ii. 819 (1753), as to citations Gron. Virg. 92 (1739), Dill. Elth. 85 t. 72 (1732). *Serratula pilosa* Ait. Hort. Kew ed. 1, iii. 138 (1785). *Liatris pilosa* Willd. Spec. Pl. iii. 1636 (1803); Pursh, Fl. Am. Sept. ii. 508 (1814); Ell. Sketch ii. 277 (1824); Ker-Gawl. Edwards Bot. Reg. t. 595 (1821). *Liatris spicata* γ *racemosa* DC. Prodr. v. 131 (1836). *Liatris propinqua* Hook. Bot. Mag. lxvii. t. 3829 (1841). *Liatris virgata* Nutt. Jour. Acad. Phil. vii. 72 (1834), and Trans. Amer. Phil. Soc. n. s. vii. 284 (1841).

New Jersey and Pennsylvania southward through North Carolina.—NEW JERSEY. Without stated locality: *A. Gray* (G); *P. D. Knieskern* (G). Co. undetermined: pine barrens, Sept. 1872, *Ex. Herb. Miss M. Treat* (G); pine barrens, Sept. 1869, *T. C. Porter* (US). OCEAN Co.: Tom's River, *W. W. Denslow* (NY); Quaker Bridge, Tom's River, 1860, *D. C. Eaton* (G, NY); pine barrens, 1 mi. w. of Tom's River, Sept. 12, 1930, *J. A. Drushel*, 8515 (US); sandy open depression, East Plains, Sept. 7, 1924, *F. W. Pennell*, 12918 (NY); dry pine barrens, Barnegat Pier, Sept. 1907, *K. K. Mackenzie*, 2919 (US); low pine barrens, Forked River, Sept. 18, 1893, *L. H. Lighthipe* (NY, US); Manchester, Aug. 28, 1879, *N. L. Britton*, 16 (G); Manchester, Aug. 31, 1878, *G. Guttenberg* (US); Manchester, Sept. 15, 1879,

A. Brown (NY); Manchester, Sept. 17, 1870, *Mus. Nat. Hist.* (NY). BURLINGTON Co.: without stated locality, *C. F. Parker* (G); Chatsworth, Sept. 5, 1897, *E. H. Eames* (G); Woodmansie, Sept. 25, 1879, *C. L. Pollard* (US); in dry sandy soil, Sept. 3, 1867, *C. F. Parker* (G); wet sand, Atsion, Sept. 5, 1917, *A. Gershoy*, 685 (G); Atsion, Aug. 22, 1879, *O. D. Allen* (G); Brown's Mills, Sept. 11, 1864, *E. Dillenbaugh* (G); ATLANTIC Co.: Egg Harbor, Sept. 6, 1884, *E. G. Knight* (NY); Egg Harbor, Sept. 6, 1884, *W. H. Manning* (G); Egg Harbor, Sept. 6, 1884, *L. F. Ward* (US); sandy soil, Egg Harbor, Sept. 4, 1938, *R. L. Schaeffer*, 827 (G); Hammonton, Sept. 6, 1913, *W. M. Benner* (G); in sand, Hammonton, Sept. 4, 1917, *A. Gershoy*, 684 (G); dry pine barrens, Hammonton, Aug. 24, 1907, *Shreve & Miller* (US). CUMBERLAND Co.: Vineland (albiflora), 1872, *Miss M. Treat* (G); sandy pineland 3 mis. s. e. of Millville, Sept. 11, 1924, *J. R. Pennell* (NY). CAPE MAY Co.: dry sandy meadow, Briar Island, Sept. 25, 1915, *B. Long*, 13592 (G); Anglesea, Sept. 20, 1891, *C. D. Lippincott* (G). PENNSYLVANIA. BUCKS Co.: Quaker Bridge, 1882, *C. D. Fretz* (Q). DELAWARE. SUSSEX Co.: sandy woods, Rehoboth, Sept. 12, 1908, *J. R. Churchill* (G); edge of salt marsh, Fenwick Is., Sept. 16, 1934, *R. R. Tatnall*, 2385 (G); Indian River Bay, Sept. 12, 1934, *A. S. Goodale*, 77591 (G). MARYLAND. HARFORD Co.: on dry bank along Bush R., n. of Bush R. Station, Sept. 10, 1902, *G. H. Shull*, 348 (NY, US); Savage Station, Sept. 4, 1905, *H. D. House*, 1527 (US). BALTIMORE Co.: Baltimore, 1866, *P. V. LeRoy* (NY); without stated locality: Sept. 1888, *G. L. S. Herb.*, 1179 (G); Springfield Road, Baltimore, 1888, *J. H. Holmes* (US); sandy clearing, shore of Bird R., 2 mis. e. of Whitemarsh, Sept. 16, 1938, *F. J. Hermann* (NY). MONTGOMERY Co.: Woodside, Sept. 20, 1896, *H. Wolds* (US). CALVERT Co.: on Miocene escarpment, at Little Cove Point, Oct. 15, 1937, *H. A. Allard*, 3827 (G, US). PRINCE GEORGES Co.: n. of Riverdale, Sept. 23, 1916, *E. S. Steele* (US); dry woods, near Hyattsville, Oct. 13, 1919, *F. W. Hunnewell* 6498 (G); sandy soil, Ardwick, Sept. 5, 1910, *F. W. Pennell*, 2647 (NY); dry gravelly field, near Bladensburg, Oct. 3, 1926, *S. F. Blake*, 9734 (G); Bladensburg, 1883, *McCarthy* (US); dryish open knoll, vic. of Lanham, Sept. 24, 1910, *W. R. Maxon & P. C. Standley*, 6 (US); Silver Hill, Sept. 6, 1915, *W. L. McAtee*, 2346 (US); in sphagnum bog, between Magruder & Benning, Sept. 6, 1899, *E. L. Morris*, 309 (US). DISTRICT OF COLUMBIA AND VICINITY. Vicinity of Washington, *L. F. Ward* (NY, US); vicinity of Washington, Sept. 17, 1880, *L. F. Ward* (G); Sluice Run, vicinity of Washington, Sept. 14, 1879, *L. F. Ward* (US); Washington, 1876, *Vasey* (US); Bates Road, vicinity of Washington, Sept. 28, 1888, *E. S. Burgess* (US); Terra Cotta, vicinity of Washington, Sept. 30, 1896, *E. S. Steele* (US); vicinity

of Washington, Sept. 12, 1922, *E. S. Steele* (US); District of Columbia, Sept. 13, 1874, *L. F. Ward*, 736 (US); dry open woods, Brookland, Oct. 2, 1927, *H. O'Neill* (NY); Takoma Park, Oct. 6, 1897, *T. A. Williams* (G); sandy woods, Takoma Park, Sept. 8, 1904, *H. D. House* (US); Takoma Park, Sept. 6, 1905, *H. D. House*, 1533 (US); sandy woods, near Takoma Park, Aug. 25, 1904, *H. D. House*, 335 (NY); sandy woods, Takoma Park, Sept. 8, 1904, *J. H. Painter*, 1149 (US); Chesapeake Beach Junct., Oct. 5, 1911, *A. Ruth*, 45 (G). VIRGINIA. ARLINGTON Co.: Fort Barnard, near Cowdons, Oct. 1, 1916, *E. S. Steele* (G, NY, US); Cowdons, near Southern Rwy., Sept. 22, 1912, *E. S. Steele* (US). FAIRFAX Co.: Fort Myer, Oct. 24, 1895, *E. A. Mearns* (NY); Falls Church, Sept. 26, 1874, *J. J. Carter* (P); Mount Vernon, Sept. 27, 1902, *F. L. Fisher* (P). NORTHAMPTON Co.: Cape Charles City, Sept. 25, 1894, *W. M. Canby*, 823 (US); NORTHUMBERLAND Co.: dry woods, Coan, Oct. 17, 1916, *I. Tidestrom*, 8185 (G). ROCKBRIDGE Co.: Balcony Falls, Sept. 5, 1883, *Dr. & Mrs. N. L. Britton* (NY). JAMES CITY Co.: field, ca. 5 mis. w. of Toano, Oct. 1, 1939, *R. W. Menzel* (G); opening in flat pine woods, Williamsburg, Sept. 25, 1920, *E. J. Grimes*, 3107 (G). CHESTERFIELD Co.: field, May, 1935, *E. Veazey* (G); dry field, near St. Elmo, Sept. 17, 1910, *P. C. Standley*, 5903 (US). CAMPBELL Co.: dry sunny hillside, at mouth of Otter R., near Altavista, Oct. 6, 1913, *J. Fauntleroy*, 610 (US); Lynchburg, Sept. 17, 1927, *W. A. Murrill* (F). WYTHE Co.: Walker Mt., Sept. 1, 1931, *E. L. Core*, 3372 (NY). SMYTH Co.: road between Marion & White Top Mt., Aug. 22, 1908, *P. A. Rydberg* (NY). SUSSEX Co.: open pine & oak woods, near Greensville line, s. of Jarratt, Sept. 18, 1938, *M. L. Fernald & B. Long*, 9453 (G). PRINCESS ANNE Co.: dry sandy barrens, Cape Henry, Sept. 23, 1933, *M. L. Fernald & L. Griscom*, 2908 (G); Cape Henry, Sept. 23, 1933, *M. L. Fernald & B. Long*, 2909 (G). HALIFAX Co.: 2 mis. n. e. of Clover, Sept. 23, 1927, *E. T. Wherry & F. W. Pennell*, 14391 (P). GREENSVILLE Co.: open thickets, clearings & woods, s. of Emporia, Sept. 20, 1938, *M. L. Fernald & B. Long*, 9455 (G). NORTH CAROLINA. AVERY Co.: slopes of Grandfather Mt., Sept. 25, 1898, *W. M. Canby & C. S. Sargent & J. Muir*, 71 (US). BURKE Co.: without stated locality, 1836, *Curtis* (NY). MCDOWELL Co.: vic. of Graphiteville, Aug. 29, 1913, *P. C. Standley & H. C. Bollman*, 10086 (US). BUNCOMBE Co.: open hillside, vic. of Montreat, Aug. 29, 1913, *P. C. Standley & H. C. Bollman*, 10079 (US); bushy hillside, vic. of Montreat, Sept. 9, 1913, *P. C. Standley & H. C. Bollman* 10497 (US); open woods, vic. of Montreat, Sept. 9, 1913, *P. C. Standley & H. C. Bollman*, 10527 (US). POLK Co.: Columbus, Aug. 10, 1897, *E. C. Townsend* (US). CRAVEN Co.: Newbern, Oct. 10, 1898, *T. H. Kearney*, 22207 (US). SOUTH CAROLINA.

GEORGETOWN Co.: sandy pine woods, Oct. 12, 1934, *F. G. Tarbox* 175-1 (NY). GEORGIA. Without stated locality: *Nuttall* (P, isotype of *Liatris virgata* Nutt.).

Var. LASIA Fern. & Griscom. A hirsute variety resembling var. *dubia* generally in arrangement and size of leaves, heads and flowers but with pubescent stem and leaves; the phyllaries too are similar, though the margins are distinctly ciliate.—RHODORA, xxxvii. 183 (1935). *Liatris pilosa* Lodd. Bot. Cab. t. 356 (1819).

New Jersey, Delaware and Alabama.—NEW JERSEY. Co. undetermined: pine barrens, Sept. 1870, *A. H. Smith* (G). CAMDEN Co.: Lindenwold, Sept. 29, 1903, *J. M. Fogg*, 622 (G, type); south of R. P. R. Station, Lindenwold, Sept. 18, 1920, *H. B. Meredith* (G). CUMBERLAND Co.: ⅓ mi. s. of Seeley's Mill, Bridgeton, Sept. 1, 1924, *Beals & Bassett* (G); 3 mis. s. e. of Millville (1 plant), Sept. 11, 1924, *J. R. Pennell* (NY). DELAWARE. KENT Co.: dry soil, Felton, Sept. 28, 1863, *A. Commons* (P). SUSSEX Co.: Rehoboth, Sept. 1908, *C. S. Williamson* (P). ALABAMA. MOBILE Co.: pine barrens, Spring Hill, Aug. 1919, *E. W. Graves*, 731 (US).

Var. SMALLII (Britt.) Fern. & Griscom. Generally a shorter, more slender variety often with reddish non-striate stems of 3–5 dm. and with fewer leaves: basal leaves quite long, linear-lanceolate (10–15 cm.) and 3–10 mm. wide, reduced upwards to bracts usually shorter than the heads: inflorescence an open, short raceme of few scattered heads, averaging approximately one head per centimeter; rachis slender; heads generally sessile, 8–12-flowered, 8–12 mm. high.—RHODORA xxxvii. 182 (1935). *Laciniaria Smallii* Britton, Man. 927 (1901).

Southwestern Virginia to Georgia, chiefly in the mountains.—VIRGINIA. AUGUSTA Co.: Mt. Rogers, Elliot's Knob, Aug. 9, 1893, *A. A. Heller & E. G. Halbach* 1179 (G, NY, P). BATH Co.: on more fertile slope, exposed shale barrens, along railroad cut just w. of tunnel, Millboro, Sept. 11, 1935, *J. W. Adams & E. T. Wherry* 2409 (G). BEDFORD Co.: without stated locality, Sept. 1, 1871, *A. H. Curtiss* (G (right plant), NY); Aug., *A. H. Curtiss*, (G); Aug. 30, 1872, *A. H. Curtiss* (ND). ROANOKE Co.: dry woods on Chestnut Ridge, just s. of South Roanoke, Aug. 25, 1942, *C. E. Wood*, 5298 (G). MONTGOMERY Co.: Blacksburg, July 30, 1895, *W. H. Murrill* (NY). GILES Co.: border of dry woods, Salt Pond Mt. (alt. 3800′), Aug. 4, 1937, *J. M. Fogg*, 12942 (G); Salt Pond Mt., Aug. 1890, *W. M. Canby* (G). WYTHE Co.: Walker Mt., Sept. 5, 1899, *ex Biltmore Herb.*, 4117h (NY); Wytheville, Lick Mt., Oct. 6, 1867, *H. Shriver* (G). SMYTH Co.: Iron Mt., along Dickey Creek, Aug. 8, 1892, *J. K. Small* (G (NY, TYPE)); slopes & summits of Iron Mt., at Skull Gap, Aug. 11–12, 1892, *J. K. Small* (US). WEST VIRGINIA. GREENBRIER Co.: Kate's Mt., Aug. 9, 1941, *F. W. Hunnewell*, 17466

(G). MONROE Co.: Cove Creek, Sweet Springs, July 22, 1929, *W. V. U. Biol. Exped.* (G). NORTH CAROLINA. YANCEY Co.: woods, Mt. Mitchell, Sept. 14, 1926, *F. W. Hunnewell*, 16028 (G). HENDERSON Co.: Hendersonville, Sept. 18, 1898, *Biltmore Herb.*, 4117d (NY); Flat Rock, Aug. 24, 1881, *J. D. Smith* (G). SOUTH CAROLINA. CHESTER Co.: Chester State Park, Aug. 12, 1935, *R. B. Mackintosh* (G). GEORGIA. WILKES Co.: without stated locality, *Herb. J. A. Lowell* (G).

Var. ELEGANTULA (Greene) K. Sch. Stems slender, almost glabrous, 5–7 dm. high: leaves mostly linear; basal ones 10–25 cm. long, 3–4 mm. wide, glabrous, with broad ciliolate petioles, sometimes with woolly tufts on the petioles or scattered hairs on the under side: inflorescence a lax racemiform spike of sessile or slenderly pedicellate heads; rachis slender and somewhat virgate to stiffer and straight: heads more horizontal and campanulate in shape, of 8–12 flowers; phyllaries ovate to oblong with rounded less scarious tips; corolla-tube 6–7 mm. long; pappus 5–6 mm. long; mature achene 3 mm. long.—Just, Bot. Jahresb. xxix[1]. 569 (1903). *Laciniaria elegantula* Greene, Pittonia iv. 316 (1901).—Georgia and Florida to Mississippi.—GEORGIA. Without stated locality: *Boykin* (G, NY, P). LIBERTY Co.: near Sunbury, *J. LeConte* (NY). HABERSHAM Co.: Tallulah Falls, 1846, *T. C. Porter* (P); dry hillsides, Tallulah Falls, Aug. 1899, *A. Cuthbert* (F); between Toccoa Falls & Tallulah Falls (alt. 1000′–1700′), Sept. 3, 1894, *J. K. Small* (NY). FLOYD Co.: Rome, *Herb. Chapman* (US). CLARKE Co.: dry oak woods, Athens, July 3, 1900, *R. M. Harper* 132 (G). GWINNETT Co.: on Yellow River, near McGuire's Mill (alt. 750′), Sept. 9, 1894, *J. K. Small* (NY). RICHMOND Co.: damp pineland, Augusta, Sept. 16, 1903, *A. Cuthbert*, 1004, 1004a (F); flat pineland, Augusta, Sept. 16, 1904, *A. Cuthbert*, 1004 (US); dry flat barrens, Augusta, Sept. 20, 1903, *A. Cuthbert*, 1004 (F). WARE Co.: Waycross, Sept. 17, 1909, *W. W. Eggleston*, 5099 (NY). MITCHELL Co.: Camilla, Sept. 20, 1909, *W. W. Eggleston*, 5129 (G, NY, P, US). LOWNDES Co.: dry woods, ca. 2½ mis. e. of Valdosta, Sept. 8, 1902, *R. M. Harper*, 1614 (G, US). FLORIDA. Without stated locality: *Chapman* (G, NY, US), *Leavenworth* (G, NY). LEON Co.: near Tallahassee, *N. K. Berg* (NY); Tallahassee, Oct. 10, 1914, *R. M. Harper*, 225 (G, NY, US). LIBERTY Co.: Aspalaga (Rwy. Sta. of Rock Bluff), Oct. 1892, *Biltmore Herb.*, 4117b (G, US). ALABAMA. TALLADEGA Co.: open rocky woods, Chandler Springs, Talladega Mts., Sept. 20, 1892, *C. Mohr* (US); dry rocky hillsides, Oct. 1893, *C. Mohr* (US); rocky dry ridges, Chandler Springs, Sept. 1892, *C. Mohr*, 1a (NY); rocky dry ridges, Mts., Oct. 14, 1893, *C. Mohr*, 1b (NY); on Talladega Mts., Sept. 1843, *Rugel* (NY). JEFFERSON Co.: East Lake, Birmingham, Oct. 9, 1896, *C. Schuchert* (NY, US). TUSCALOOSA Co.: e. of Tuscaloosa, Sept.

23, 1933, *R. M. Harper*, 3121 (G, US); mixed woods, edge of pine barrens, 10 mis. n. e. of Tuscaloosa, Oct. 4, 1912, *H. H. Bartlett*, 3337 (US). LEE Co.: Auburn, Oct. 18, 1896, *F. S. Earle* (ND, TYPE of *Laciniaria elegantula* Greene); in dry open woods, sand or clay (common), Auburn, Sept. 28, 1899, *F. S. Earle & E. S. Earle*, 95 (G, NY, ND, US); Auburn, Oct. 9, 1898, *F. S. Earle & C. F. Baker* (NY, US), Sept. 18, 1897, *F. S. Earle & C. F. Baker* 1343 (NY), Sept. 20, 1896, *C. F. Baker*, 51 (NY), Oct. 10, 1896, *C. F. Baker*, 50 (NY), Sept. 1900, *F. E. Lloyd & F. S. Earle* (NY). MONTGOMERY Co.: without stated locality, Sept. 21–23, 1909, *W. W. Eggleston*, 5141 (NY). BALDWIN Co.: dry sandy pineland, Bay Minette, Sept. 6, 1912, *F. W. Pennell*, 4549 (P, US). MISSISSIPPI. JACKSON Co.: Biloxi, Sept. 6, 1900, *Tracy & Lloyd*, 560 (NY).

Among the Walter specimens in the British Museum there is none labelled *Anonymos graminifolia*, but one labelled *Chrysocoma affinis* F. 309 (supposedly referring to Fraser) and with Nuttall's annotation *Liatris* in pencil, has been taken as undoubtedly the plant described under the former name. Dr. H. K. Svenson kindly gave me notes and sketches made of the specimen when he was in London in 1938. These show the whole plant, including the basal corm, to be tall. His measurements of the inflorescence are "50 x 1.5 cm." and his comment "narrow". The lower leaves are described as: "1 dm. x 2 mm. glabrous, except within the base which was not closely examined. The involucral bracts were rugose at the apex but not pubescent, slightly ciliate at the margins".

These careful observations, I believe, help us finally to recognize for Walter's type the slender-stemmed, many- and very narrow-leaved plant found especially along the coastal plain of Virginia and the Carolinas that has passed under the general term *Liatris graminifolia* and which I have described as var. *typica*. Elliott (Sk. ii. 274 (1824)) seems to have had this variety in mind when he wrote his description of *L. graminifolia*. The species, as here defined, centers on Walter's specimen and description.

Barton (Mat. Med. ii. 223, t. 49 (1818)) states that after a thorough examination of specimens in the Muhlenberg Herbarium he could not satisfactorily refer a *Liatris* that he had, to any of the species described by Pursh, Michaux, or Willdenow and so named it *L. dubia*, clearly illustrating and carefully

describing it. Although the specimen can unfortunately not be located at present in the herbarium of the Philadelphia Academy of Sciences, Barton's plate and description including "the striated stem covered with a sparse and hispid pubescence, . . . the lower leaves longer and much wider than the upper . . . the upper leaves much smaller and linear, ciliated for the most part at the base", seems clear and directly applicable to many specimens in herbaria collected from back of the coastal plain, from New Jersey to Georgia and distributed under the name *Liatris graminifolia*. Gray (Man. ed. 1, 191 (1848)) first made the combination *L. graminifolia* var. *dubia* and this has been adopted here.

As explained in the discussion of *L. spicata* (see no. 1) Clayton's plant from Virginia and Gronovius' description of it, which was cited by Linnaeus in the description of *Serratula spicata* and in turn by Willdenow in the description of *Liatris spicata* is a plant more commonly recognized now as *L. graminifolia*. Torr. & Gray (Fl. N. Am. ii. 73 (1841)) and Gray (Synop. Fl. i^2. 111 (1884)) had rightly excluded the Gronovian citation by Linnaeus from *L. spicata*. Gray included it in synonymy of *L. graminifolia*, attributing that name to Pursh as the first to define the species correctly. Upon comparing the Barton plate with the Gronovius' and Dillenius' figures, it seems they are very similar, especially when allowing for the effect of cultivation, shown in the Dillenius' figure, and considering Barton's own comment: "this plant is one of a genus nearly all the species of which vary considerably, particularly in those marks usually supposed to be characteristic, as the sessile and pedicellated flowers". Further, as stated above, examination of a floret of the Clayton plant showed the corolla-tube to be pilose within and so are found to be the florets of the so-called *graminifolia* specimens. Clayton's plant may be cited, then, as by Gray, under *L. graminifolia* and more correctly under var. *dubia* which is a large robust plant occurring abundantly in Virginia. While the two varieties, *typica* and *dubia*, overlap in the more eastern part of their range (as for example, two specimens of R. R. Tatnall from Delaware show, that of Sept. 23, 1934, no. 4053, from moist swale, ¼ mi. e. of Ellendale, Sussex Co. (G) resembling *typica* and that of Sept. 16, 1934, no. 2385, from the edge of salt marsh, Fenwick Is.,

Sussex Co. (G) resembling *dubia*) no specimens of the former have come from the mountainous counties to the west.

Still further confusion has been added by Aiton's brief description (Hort. Kew. ed. 1. iii. 138 (1789)) of *Serratula pilosa* as "S. foliis linearibus pilosis, floribus axillaribus longe pedunculatis". Willdenow l. c. adopted the same description when transferring the species to *Liatris*. Although no Aiton specimen was found at the British Museum or Kew in the summer of 1939, there is fortunately a head of Aiton's type "from the Banks Herbarium" at the Gray. From this specimen it can be learned that the head contains at least 10 flowers having a corolla ca. 8 mm. long and pappus 6 mm. long. The almost linear phyllaries are ca. 11 mm. long and 1–1.5 mm. wide and slightly narrowed and ciliate at the tip. The corolla-tube is also slightly pilose within. Also in the British Museum, Mr. Weatherby found a specimen from the herbarium of Goodenough, bearing, in the latter's handwriting, the label, "*Serratula pilosa sp. nov.* 1785". The photograph of this sheet shows a loose inflorescence, that by calculations would measure about 3 dm. in height, bearing heads about 1 cm. in length on leafy peduncles four to six times as long, giving the panicled appearance common in *Liatris* when grown in cultivation. Two slenderer stems on the same sheet, each with one terminal head, may have been longer peduncles cut off lower down on the main stem. However, the size of the heads and character of the phyllaries are in agreement with those of Aiton's specimen. Unfortunately only the very narrow upper leaves are present on any of the stems and so the extent of their pilosity cannot be determined. Elliott (Sk. ii. 277 (1822)) added the note to his description of *L. pilosa* based on Willdenow, Pursh and Nuttall, "This variety is certainly not sufficiently hairy to have merited the trivial name which belongs to this species", and he included questioningly var. *dubia* Barton in synonymy. Support is given this opinion by the note of E. G. Baker found in the National Herbarium in connection with comparisons made of specimens sent him. He states of the type "*Serratula pilosa* Aiton, Hort. Kew. ed. 1. iii. p. 138. (1) The heads are axillary and rather long-peduncled. (2) The heads are rather larger. (3) The plant is pilose. (4) The involucral bracts are narrow and subacute. (5) Lodd. Cab. t. 356 is a figure of the true plant.

The plant is not so thickly pilose as the figure. (6) The true plant seems inseparable from the plant figured in Barton's Med. Bot. ii. t. 49 as *L. dubia*." Until the Aiton specimen may be again examined it seems to this author also that it would be best to include it in such synonymy.

Torr. & Gray (Fl. N. Am. ii. 74 (1841)) described *Liatris pilosa* from the Aiton specimen and one of Mr. Read's collection from Seven Mile Mountain, Va., now in the Philadelphia Herbarium. However, later in Synop. Fl. i². 111 (1884) it was made synonymous with *Liatris graminifolia* var. *dubia* and referred to as a variety with many large heads with the range "sandy pine barrens from New Jersey to Florida and Alabama". Examination of the Read specimen (P), showed a plant with quite broadly lanceolate basal leaves, a spike 18.5 cm. long with 9 distant larger heads ca. 1.5 cm. long and 1.5 cm. wide, and phyllaries with a narrow scarious margin. Of the specimen Torr. & Gray l. c. had written: "Plant nearly as stout as *L. scariosa*", and to the writer too it seems distinctive but more closely related to plants found more abundantly in the mountains, that are here described as *L. turgida*. (see no. 9).

The really pubescent or hirsute variety of this species has been described by Fernald and Griscom from the northern part of its range as *Liatris graminifolia* Willd. var. *lasia*. The plate of *L. pilosa* (Loddiges Cab. t. 356 (1819)) shows a very pubescent plant, which could have belonged to this variety.

With this species has been included a slenderer-stemmed plant, with long basal leaves, typified by a specimen of *J. K. Small*, Aug. 8, 1892, from Iron Mountain, Smyth Co., Va. (NY) and described as *Laciniaria Smallii* Britton (Man. 927 (1901)). Fernald and Griscom, l. c., finding a match for this in their specimen of Sept. 25, 1933, no. 2907 from the desert at Cape Henry, Princess Anne Co., Va. (G) reduced it to a variety of *Liatris graminifolia*, since it could not be separated from that species by any satisfactory characters. Comparison of specimens show that much of this species coming from the mountain regions of south-west Virginia and of adjoining states bear a resemblance to Small's plant from Smyth Co., in the loose infloresencec of sessile, 8–12-flowered heads beyond which the bract-like leaves do not extend, and the generally fewer leaves

(basal ones being longer and wider) with scattered hairs on the under surface. Some specimens are, however, less slender and have a more spike-like inflorescence with heads of appressed almost orbicular phyllaries which on herbarium sheets have been questioningly referred to *L. pilosa* Ait. Until Aiton's specimen may have been found, the evidence given from the single head at Gray and a photograph from the British Museum of Goodenough's specimen match var. *dubia* better than this variety from the mountains. Since the specimen of Read, from Seven Mile Mountain, Va. (P) referred to by Torr. and Gray, Fl. N. Am. ii. 74 (1841) in their discussion of *L. pilosa*, seems to bear closer resemblance to specimens as of Aug. 30, 1912, *E. S. Steele*, no. 24, from Afton, in the Blue Ridge Mountains, Nelson Co., Va. (US), it has been included under the new species *L. turgida*. Though *L. Helleri* Porter is similarly found limited to a small section of the Appalachian Mountains it seems to represent a different segregate and is distinguished from this species by the short pappus, the usually quite glabrous leaves and the few closely arranged heads.

Greene (Pittonia, iv. 316 (1901)) described a species similar to Small's but taller and of more southern range, from a specimen of Oct. 18, 1896, *F. S. Earle*, from Auburn, Lee Co., Ala. (ND) which he called *Laciniaria elegantula*. By the turbinate heads and narrowly lanceolate leaves with ciliate petioles it seems to belong to the *graminifolia* alliance, as here interpreted, rather than to the *Scariosae* as suggested in his description. After careful comparison of this plant with that of Small from Smyth Co., Va. and examination of a number of specimens in the herbaria it seems that one form passes into the other. Yet in the southern part of its range the taller and somewhat stiffer *elegantula* seems to become even stiffer so that it is still more difficult to make sharp delimitation of the most southern Florida material from the Greene type from Alabama. Thus, rather than broaden the conception of *L. Smallii* it has seemed more helpful to split off the more northern, short material as var. *Smallii* from the southern, taller plants, var. *elegantula*, and include therein the stiffer Florida ones. However, that these Florida specimens may be wider variants is again suggested by possible intermediates between this variety and *L. gracilis*, as

in the specimen of Oct. 10, 1914, *R. M. Harper*, no. 225, 2 miles e. of Tallahassee, Leon Co., Fla. (G, NY).

L. graminifolia is by far the largest species of the *Graminifoliae* series and out of it have probably arisen the more localized segregates that follow.

8. LIATRIS HELLERI Porter. Rootstock in older plants large and shallow, usually 5–6 cm. across and 2–4 cm. deep, giving rise to many radical glabrous linear-lanceolate leaves 2–3 dm. long and 6 mm.–1 cm. wide at the middle, diminishing to long, winged, non-ciliate petioles; cauline leaves diminishing uniformly upward in short-pyramidal form to bracts less than the length of the flower-heads; only a few scattered cilia at base of leaves or along veins: inflorescence-bearing stems 1 or 2, rarely more than 2 dm. high, with heads occurring closely and covering one third the length; heads turbinate at the time of flowering, 12–15 mm. high, 7–10-flowered; phyllaries oblong-ovate, with narrow scarious rim and beyond it a finely ciliolate margin; corolla purple, 5–7 mm. in length, slightly pilose within the tube; pappus scanty, barbellate, only 2.5–4 mm. long, i. e. half the length of the corolla and hardly showing beyond the involucre at the time of flowering: achene 2.5–3.5mm. long.—Bull. Torr. Bot. Club, xviii. 147 (1891). *Lacinaria Helleri* Porter, Muhlenbergia i. 6 (1900).

Has been found only on the mountains of North Carolina.—NORTH CAROLINA. WATAUGA Co.: Blowing Rock Mt., Aug. 18, 1890, *A. A. Heller*, 81 (NY, type (ND, US)), Aug. 18, 1890, *A. A. Heller*, 82 (NY); Blowing Rock, Aug. 17, 1891, *A. B. Seymour*, 22 (G), Aug. 1928, *W. C. Ferguson*, 18 (NY); dry soil, exposed rocky ledge, Blowing Rock, Aug. 1, 1922, *L. F. Randolph & F. R. Randolph*, 1161 (G). CALDWELL Co.: ledges of Blowing Rock (elev. 4200′), Aug. 6, 1891, *J. K. Small & A. A. Heller*, 344 (G, NY, P, Q, O, US, F (without no.)); e. of Blowing Rock, (3500′-4000′), Aug. 24, 1893, *A. A. Heller*, 1236 (NY, US); summit of Grandfather Mt., Sept. 25, 1898, *W. M. Canby, C. S. Sargent & J. Muir*, 70 (US); Grandfather Mt., Aug. 9, 1890, *G. B. Sudworth*, 95 (US); peaks of Grandfather Mt., Linville Station, Aug. 11, 1890, *G. B. Sudworth*, 115 (G, US). AVERY Co.: high rocks, s. end Beech & Grandfather Mts. (alt. 1650 m.), Sept. 1–2, 1915, *E. S. Steele*, 89 (G, NY). BURKE Co.: Table Rock Mt., Aug. 2, 1890, *A. A. Heller*, 81 (NY), 82 (P). MITCHELL Co.: mountain meadows, Roan Mt., July 10, 1894, *C. Mohr* (US).

This species, of a very limited mountain range, seems distinctive in its very short pappus since others having both plains- and mountain-habitats have not shown this variation. Like the type, from Blowing Rock Mountain, all other specimens seen are short, indicative of growth only on exposed barren ledges.

It is to be distinguished from varieties *typica* and *dubia* of *L. graminifolia* by these characters and from the shorter var. *Smallii*, which occurs in neighboring mountains of Virginia, by the slender stems bearing few distant heads. *L. turgida* of the same series, has a more robust, elongate inflorescence.

9. Liatris **turgida,** sp. nov., cormo globoso (juniore) vel (vetustiore) irregulari compresso 4–5 cm. lato ad 4–5 caules emittente; caulibus saepe singulis subcrassis saepe rubescentibus nec striatis 6–9 dm. altis glabris vel sparse vel dense pilosis pilis longis albis curvatis; foliis vix numerosis lineari-lanceolatis pagina inferiore et ad basem sparse vel subcopiose pilosis, basalibus plerumque quam apud *L. spicatam* vel *L. graminifoliam* longioribus latioribusque saepe 10–15 cm. longis 1 cm. latis ad basem et ad apicem aequaliter angustatis petiolo alato, superioribus epetiolatis angustioribus fere linearibus ad bracteas quam capitula breviores reductis; spica simplice racemiformi; capitulis inter se 1–2 cm. distantibus sessilibus vel breviter pedicellatis 9–20-floris anthesi subturbinatis 1–1.5 cm. altis et latis; phyllariis plerumque purpureis adpressis glabris marginibus anguste scariosis vel ciliolatis, exterioribus ovatis aliquando fere orbiculatis, interioribus oblongis vel linearibus obtusis ca. 12 mm. longis; corollis purpureis 8–9 mm. longis, tubo intus piloso; achaeniis 4–5 mm. longis, pappo 6–7 mm. longo.—Mountain ridges of southwestern Virginia and adjoining West Virginia and North Carolina.

Rocky woods, road to Royal Orchard, vicinity of Afton in the Blue Ridge Mts., alt. 600 m., Nelson Co., Virginia, Aug. 31, 1912, *E. S. Steele* 24 (US 643319, type).

VIRGINIA. Page Co.: vicinity of Stony Man Mt. (alt. 3600′), Blue Ridge near Luray, Sept. 3, 1901, *E. S. Steele & Mrs. Steele*, 241 (G, NY); vicinity of Stony Man Mt. (alt. 3500′), Blue Ridge near Luray, Aug. 28, 1901, *E. S. Steele & Mrs. Steele*, 241 (NY, US); Honzman, Aug. 1891, *Miss L. Smith* (US); Hawksbill Mt., Aug. 30, 1891, *W. Palmer, W. H. King* (US). Rockingham Co.: vicinity of Elkton, foot and slopes of Blue Ridge Mts., 1918, *E. S. Steele* (G). Augusta Co.: slopes near Jennings Gap, vicinity of Stribling Springs (alt. 570 m.), Aug. 24, 1917, *E. S. Steele*, 23 (G); Little North Mt., vic. of Augusta Springs, Aug. 29, 1908, *E. S. Steele* (US 785731, -3, -4, -5); Elliott's Knob (1200 m.), Aug. 27, 1913, *E. S. Steele*, 56, 72 (US); spur of Elliott's Knob, vicinity of Augusta Springs, Aug. 29, 1908, *E. S. Steele* (US 785727), Sept. 8, 1908 (US 785728, -9); vic. of Fordwick and Craigsville, 1913, *E. S. Steele* (G); Elliott's Knob, summit (alt. 1320 m.), vic. of Augusta Springs, Sept. 2, 1908, *E. S. Steele* (US 785730); Elliott's Knob (alt. 1200 m.), vic. of Augusta Springs, Sept. 2, 1908, *E. S. Steele* (US 785732). Bath

Co.: vic. of Millboro (alt. 480 m.), Aug. 26, 1907, *E. S. Steele* (P); vic. of Millboro, Panther Gap, Sept. 6, 1907, *E. S. Steele* (US 643315); railroad, vic. of Millboro, Aug. 21, 1907, *E. S. Steele* (US 643317); vic. of Millboro (alt. 510 m.) Aug. 29, 1906, *E. S. Steele* (US 590180). NELSON Co.: rocky woods, road to Royal Orchard, vic. of Afton, in the Blue Ridge Mts. (alt. 600 m.), Aug. 31, 1912, *E. S. Steele*, 24 (G, US 643318, -20, -22, -23); Afton, road to Royal Orchard, Sept. 19, 1909, *W. S. McAtee*, 1243, 1245 (US); high cliff, toward Humpback Mt., vic. of Afton, Sept. 13, 1912, *E. S. Steele*, 121 (US). ROCKBRIDGE Co.: North Mt., near Lexington, Aug. 26, 1924, *J. R. Churchill* (G); vicinity of Goshen, alt. 450 m., Sept. 4, 1904, *E. S. Steele* (US 494378, -80); mts., e. of Natural Bridge, Sept. 13, 1907, *E. B. Bartram & B. Long* (US). BEDFORD Co.: without stated locality, Sept. 1, 1871, *A. H. Curtiss* (G, left plant). CRAIG Co.: (and MONROE and ALLEGHANY, W. Va.) Co.: alt. 600 m., Aug. 22, 1903, *E. S. Steele & Mrs. Steele*, 86 (G, NY, US), Aug. 30, 1903, *E. S. Steele & Mrs. Steele*, 166 (G, NY, US); Johns Creek Mt., Aug. 26, 1903, *E. S. Steele* (US); Potts Mt., Aug. 28, 1903, *E. S. Steele* (US). MONTGOMERY Co.: Blacksburg, July 20, 1895, *W. H. Murrill* (NY). GILES Co.: Brush Mt., 2 mis. e. of Newport, Aug. 30, 1933, *E. J. Alexander, T. H. Everett & S. D. Pearson* (NY); Salt Pond Mt., Bald Knob, Aug. 25, 1899, *C. L. Pollard & W. R. Maxon*, 69 (NY, US). WEST VIRGINIA. GREENBRIER Co.: dry upland, 1 mi. s. of White Sulphur Springs, Aug. 10, 1922, *L. F. Randolph and F. R. Randolph*, 1281 (G); White Sulphur Springs, July 16, 1892, *A. Brown* (NY); White Sulphur Springs, July 31, 1877, *G. Guttenberg* (NY); dry woods, White Sulphur Springs, Aug. 27, 1903, *K. K. Mackenzie*, 359 (NY, US). MONROE Co.: Peters Mt., vic. of Old Sweet Springs, Sept. 9, 1905, *E. S. Steele* (US). NORTH CAROLINA. BURKE Co.: dry woods, Jones Ridge, July 22, 1933, *F. W. Hunnewell*, 12982 (G). BUNCOMBE Co.: rocky roadside banks, near Black Mt., Aug. 23, 1927, *K. M. Wiegand & W. E. Manning*, 3176 (G).

It is a pleasure to adopt the specific epithet found on many of the National Herbarium sheets of Mr. E. S. Steele's specimens under another generic name, since his rich collection from the mountains of Virginia has, in our mind, established the identity of the species.

While the species here described may resemble *L. graminifolia* var. *dubia* in shape and distribution of the heads and *L. spicata* in the appressed ovate phyllaries, it cannot be merely referred to as an intermediate between the two. It is to be distinguished from the former by its rather stout stem, the loose raceme-like arrangement of heads showing somewhat appressed ovate, orbicu-

lar or oblong and obtuse-tipped phyllaries, rather than loose, narrowly lanceolate, ciliolate-margined ones, and by lanceolate leaves having scattered hairs over one or both surfaces but lacking the marked basal cilia along a winged petiole. It resembles the variety *Smallii* of *L. graminifolia* most in the nature of the spike, of rather distant sessile heads beyond which the upper bract-like leaves do not extend, but it differs in having a stouter and stiffer rachis, usually with more heads and more orbicular appressed bracts, and in having leaves frequently covered with hairs, a character in which it also differs markedly from *L. spicata.*

There are three specimens (US 643318, -19, -20) of collection no. 24 of E. S. Steele, Aug. 31, 1912, from the vicinity of Afton, Nelson County, and these show variation from an almost glabrous condition to an abundance of scattered hairs; of these, the intermediate condition was chosen as the type, though the description allows for the inclusion of all. Collected only from the mountain ridges of Virginia and the neighboring ones of West Virginia and North Carolina it has frequently been referred to as *L. pilosa* Ait. on herbarium sheets but until Aiton's specimen may have been found (see no. 7) the evidence gathered makes that name seem inapplicable to this plant. However, the one specimen of Read, from Seven Mile Mountain, Va. (P) referred to by Torr. & Gray Fl. N. Am. ii. 74 (1841) in their discussion of *L. pilosa* seems to have a closer resemblance and it is here included. Though *L. Helleri* Porter is similarly found limited to a small section of the mountains, it seems to represent a different segregate, distinguished from this species by the short pappus, the few, though closely placed, heads, and usually quite glabrous leaves.

(To be continued)

Edgar Burton Harger.—In the passing of Mr. Harger, the Connecticut Botanical Society has lost one of its most active and gifted members. He had a large part in the organization of the Society in 1903, became a charter member, and at the first meeting was elected corresponding secretary, an office in which he served with zeal and distinction for twenty-three years. On the death of Charles H. Bissell, he was elected president and served